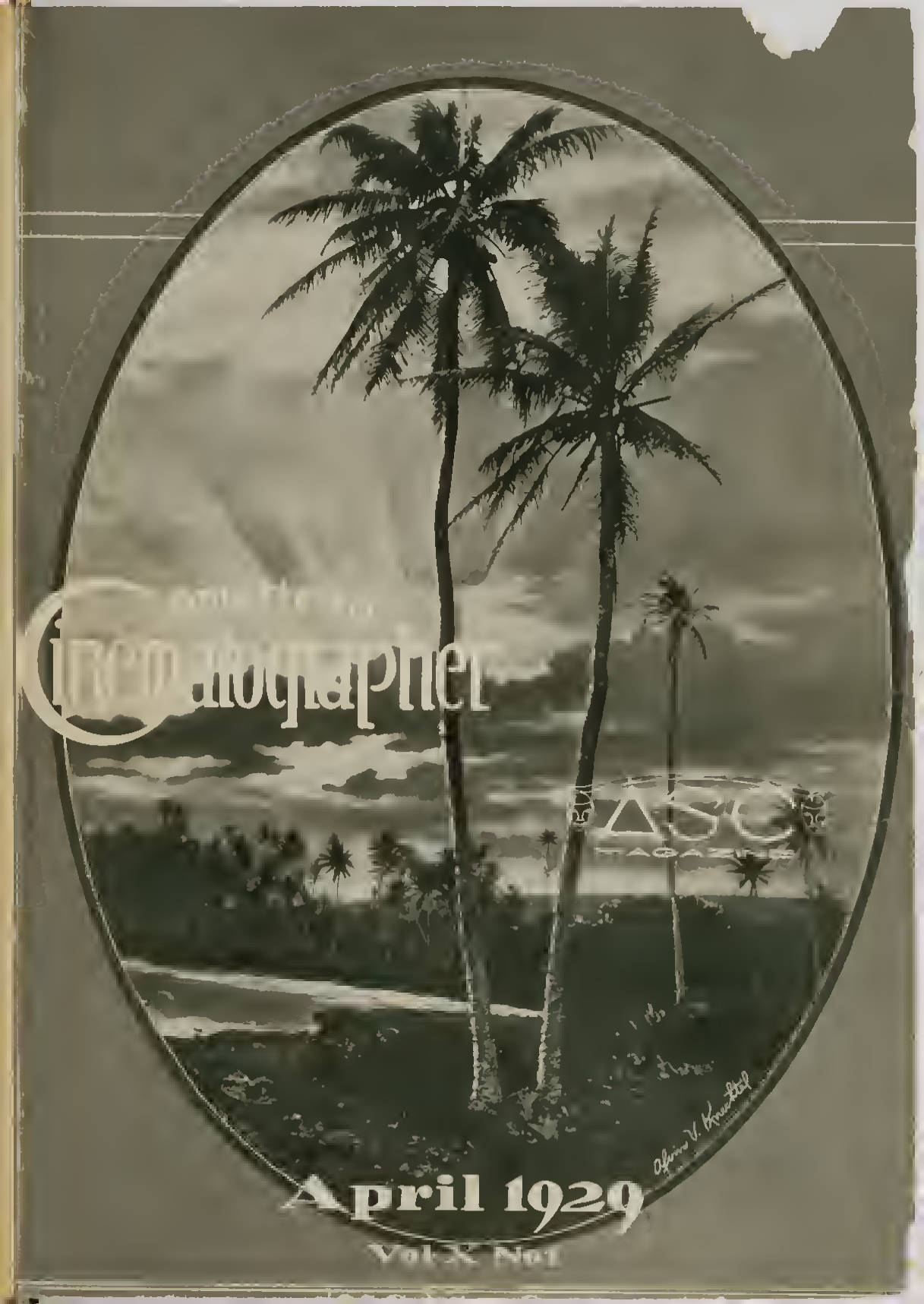
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Vol. X **CONTENTS** No. 1

The Dawley Patent 4

Shooting Elephants with a Camera
By Jack Smith, A.S.C. 6

Let Us Have Peace
By Howard E. Campbell 9

Stereoscopic Motion Pictures
By Max Ritterath 10

Putting the Light Where You Want It 13

Amateur Studio Pictures
By J. S. Watson, Jr.—S.M.P.E. 14

Jimmy the Assistant
By Himself 17

Patents vs. Patents vs. Practice
By Carroll H. Dunning 18

The Gall Patent
An Excerpt 19

The A.B.C. of Sound—2nd Paper
By Joseph Dubray 25

Incandescent Lighting Improves
By R. E. Farnham 31

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The Dawley Patent

An Opinion by the Firm of Prindle, Wright, Neal and Bean Patent Attorneys of New York

This Dawley patent was filed August 17, 1914, when the art of making motion pictures was in its infancy.

The inventor was a practical man engaged in motion pictures at that time, and realizing the tremendous expense incurred directly and indirectly due to the cost of sets, drops and other scenery, and the time consumed in making the same, made the improvement in the art disclosed and claimed in the patent. He also clearly recognized the advantages of being able to use photographs of distant locations to make a background for the action, and sets forth all of these advantages in considerable detail in the specification of his patent.

His invention resides broadly in effecting photographic images of a photograph of a set or scene on the negative and in effecting photographs of the actors and necessary property supplementing the same on the negative, in such a manner that the two sets of images or photographs properly merge in the complete negative, whereby the same effect is produced as if the action took place directly in front and in connection with an original background, scene, set or the like.

The inventor describes in detail the various ways in which this method may be practiced, and his specification shows that he has a comprehensive grasp of all the problems involved in making motion pictures in this manner and discloses various practical ways in which his invention could be put into successful use.

As an illustration of the extent to which the inventor had thought out the problem and the solution thereof, we call your attention to the statement appearing on page 1 of the specification, lines 78 to 84, inclusive, which read as follows:

> "I accomplish these objects by utilizing photographic images of the sets or scenery instead of using real sets or scenery, the photographic images being photographed either directly, or by reflection, or by projection, or jointly directly, reflectively or projectively.
>
> "In making a picture, the photographing of the actors who are enacting the story or plot, and the photographing of the photographic image constituting the background or set may be effected either simultaneously or successively."

The inventor then proceeds to describe these various suggested methods in greater detail, and as stated above, we are impressed with the comprehensive manner in which he viewed and solved his problem. A complete reading of the specification is necessary to fully appreciate this.

To repeat, the inventor's main object was the saving of expense and time and the reduction of the cost of making motion pictures by effecting photographic images of a background or set on a negative in connection with photographs of the action. This method or process is very broadly covered in the claims in the patent, and especially in claims 1 and 5 thereof.

Claim 1 includes the following steps involved in this invention in the art of making motion pictures:

1. Effecting photographic images of a photograph of a set or scene on the negative;
2. Effecting photographs of actors and properties supplementing the same.
3. The images of the photograph (background) being photographed at such a point in the range of the camera as to be relatively small and properly merge with the field covered by the living actors.

Claim 5 expresses substantially the same thought, including the following steps:

1. Effecting photographic images of a photograph of a set or scene on the negative.
2. Superimposing thereon photographic images of actors and properties supplementing the same.
3. Same as claim 1.

Claim 2 is quite similar to claim 1, being limited in that it calls for **simultaneously** effecting photographic images of the photograph of the set or scene and of the action.

Claim 3 is exactly like claim 1, except for the limitation added thereto specifying that the photographing is effected **simultaneously by reflaction and directly.**

Claim 4 defines the same general process, but includes specifically that the background is formed by effecting photographs of a **reflected image** of the set or scene and that the photographs of the actors are **effected directly.**

Claim 6 brings in details involved in the practice of the process, including effecting photographic images of the actors in front of a black background, and specifying that the floor line of the images of the photograph of the set or scene coincides with the stage on which the actors move.

Claim 7 is similar to claim 6, but differs in that it defines the invention in greater detail in that it recites that the black background has openings therein corresponding with the exit and entrance openings in the photographs so as to secure exit and entrance effects.

When the Dawley application for patent was filed it included ten claims, the first three of which were specific to a motion picture positive film, and the last seven of which were directed to the art of making motion pictures. The Patent Office at once required division between the first three claims and the last seven claims on the ground that they covered independent inventions. This is a customary formal requirement and was complied with by the cancellation of the three claims directed to the positive film. The attorney for the inventor added two more claims directed to the art of making motion pictures. In the first official action by the Patent Office the following patents were cited, without specifically rejecting any of the claims:

Bruce (British) No. 15,192, of 1886; (1 sheet)
Messter (British) No. 23,623, of 1910; (1 sheet) (88–24)
Knight, No 1,102,595, July 7, 1914,
Fitch, 663,267, Dec. 4, 1900,
Engelsmann, No. 1,019,141, March 5, 1912; (88–24)

After the cancellation of the three claims and the addition of the two claims above referred to, the Examiner in the Patent Office cited the following additional patents:

Schulze, et al. (French), 444,112, July 30, 1912 (1 sheet), (88—24)
Brown (British), 6,557 of 1913 (1 sheet)
Blitz (British), 7,334 of 1913 (1 sheet) (88—24)

and held that no invention was involved in the claims submitted.

In reply to this first rejection on the merits, the attorney for the inventor stated that the inventor was the first to suggest the substitution, for the usual expensive sets or natural scenery, of a photographic image.

The various patents cited by the Examiner were analyzed as follows in this reply:

> "Fitch, No. 663,267, discloses a rather involved arrangement requiring two lanterns and two screens, each projecting its own image and in connection with which actors may perform to a limited extent with the observations always made direct by the eye, and has no reference to the motion picture art;
>
> Engelsmann, No. 1,019,141, discloses an apparatus for exhibiting motion pictures, in which the pictures are projected on a transparent sheet of glass, through which a plastic background is observed.

But with this arrangement there is no photographing of the actors, nor is there any suggestion of its possible use for securing effects such as applicant obtains.

Knight, No. 1,102,595, discloses an arrangement in which the stage is surrounded by a screen like a frame, and on which a motion picture is projected while the actors perform within the space surrounded by the screen.

Bruce, No. 15,192 of 1886 (British), discloses an arrangement for securing dissolving view effects in which a transparent screen is used, one view being observed by reflection and the other directly.

Messter, No. 23,623, of 1910 (British), discloses an arrangement in which pictures are projected on a transparent screen so as to secure a proximation to a stereoscopic effect, but in which there are no actors and which is not capable of use for securing the results obtained by applicant.

Schulze, No. 444,112 (French), discloses a very common arrangement in which a projected image is thrown on a transparent screen and is observed directly.

Brown, No. 6,557 of 1913 (British), discloses an arrangement by which a motion picture is reflected on a transparent screen and a real set is observed directly through the screen.

Blitz, No. 7,344 of 1913 (British), discloses an arrangement for securing a stereoscopic effect by projecting a motion picture on a translucent screen and observing the same directly through a transparent screen on which the image of the background is projected."

The Patent Office Examiner replied to this argument by again rejecting the claims upon the patents previously cited, and referring to two additional patents—Thomas, 871,418, September 27, 1910 (46—Theatrical Appliances), and Thurston, 1,104,846, July 28, 1914 (same class). At this time, the Examiner apparently became convinced that the inventor had made a real invention and contribution to the art of making motion pictures, because he made the following suggestion to the applicant:

"It is suggested that the claims bring out the fact that the image produced from slide '5' is caused to be reflected at such a point in the field of view or range of the camera 1 that this image can be relatively small and at the same time properly merge with the field covered by the living actors on stage 2. If this relation of parts is brought out in the claims, they will probably be allowed as now advised."

In view of this action and suggestion, the attorney for the inventor prepared an amendment inserting the claims just as they are included in the patent as granted, and these claims were allowed without any further criticism or objection by the Patent Office Examiner.

None of the prior patents cited by the Examiner discloses or anticipates the Dawley invention in any respect whatsoever. Taking them numerically, we find that United States patent to Fitch, No. 663,267, December 4, 1900, shows an apparatus for producing scenic representations, or what we would call a "stage effect" by having two screens on the stage, one toward the front or proscenium arch, and the other at the rear of the stage, and projecting picture images upon these screens, the image on the front screen being projected from the front, and the image on the rear screen being projected from the rear, so that the performers may move and act on the stage between the two screens. This has nothing to do with motion pictures at all.

Thomas, 971,418, September 27, 1910, is for a stage effect and involves the projection of motion pictures upon a suitable screen and having provision made in front of this screen so that objects or actors may move, giving a combination effect of motion picture and human actors.

Engelsmann, 1,019,141, March 5, 1912, for an apparatus for showing kinematographic pictures. This is a stage effect which involves reflectively showing a motion picture without a background upon a transparent screen and having a background located to the rear of said transparent screen and visible therethrough.

Knight, 1,102,595, July 7, 1914, is for a stage effect called a composite dramatic production which involves a central stage setting just as in the ordinary theatre and using actors, and having a motion picture film projected in the space around the central stage setting so that the action in the motion picture film may merge into the action on the stage, and vice versa.

Thurston, 1,104,846, July 28, 1914, apparatus for producing stage effects. This relates to an automobile race upon an endless track on a stage with movable objects. The curtain or drop is provided with a representative continuation of the track, and a motion picture of the cars moving is projected on the curtain track, which produces an illusion of an automobile race of considerable extent.

British patent to Bruce, 15,192 of 1886, is for an apparatus for working dissolving view effects, and involves the use of two projecting lanterns projecting pictures upon a screen visible to the audience, one lantern projecting directly upon the screen through a transparent screen, and the other lantern projecting the picture upon the screen by reflection.

British patent to Messter, 23,623, of 1910, is for what the inventor calls an "optical theatre," and relates to a miniature theatre stage in which pictures are projected from beneath the stage by mirror and lens on to a transparent screen, which is located in front of scenery, whereby a stereoscopic effect is given.

British patent to Brown, 6,557 of 1913, is for a cinematograph apparatus for producing stereoscopic or plastic effects. This invention involves the use of a motion picture taken against a black background and projected directly on a screen, with the image of the scenery shown on a flat glass or transparent mirror so as to give a stereoscopic effect.

British patent to Blitz, 7,344 of 1913, is for a means for obtaining a stereoscopic effect with pictures. This includes projecting a motion picture on a screen visible through a transparent mirror. The scene or scenery is reflectively shown on this transparent mirror so that the audience has a composite streoscopic view.

French patent to Schulze and Baram, 444,112 of 1912, is for an apparatus for exhibiting scenes or views with a stereoscopic effect. This invention involves projecting a motion picture on a screen which reflects to a transparent mirror, the transparent mirror being located in front of the scenery so as to give a composite stereoscopic effect.

These prior patents, which are all the prior patents cited by the Patent Office, almost entirely relate to stage effects and to the projection of motion pictures in combination with scenery, so as to give a stereoscopic effect. None of them was concerned in the making of motion pictures without the use of expensive sets or scenery, or with using photographic images of a photograph of a natural scene as a background. These prior patents were very remote, and, in our opinion, the Examiner was entirely justified in allowing Dawley claims adequate to give him broad protection on his invention.

Some pretense or suggestion might be made that still picture photographic practice would anticipate the Dawley invention, but any position taken on this ground would indicate lack of knowledge of the difference in the problems involved in motion picture photography, and in still picture photography. The making of motion pictures is an entirely different art from the making of still pictures and involves many more problems and factors which have to be considered, and therefore the making of composite negatives in the still picture art, such as practiced many, many years ago, would seem to have no bearing on or application to this invention.

We understand that you have conducted a very extensive investigation as to prior uses of this invention and of similar ideas without success. The defense of prior use is always a difficult one to establish, because it must be proved with utmost certainty as to time, place and exactitude of structure or of process. It must be established by a sufficient number of witnesses to convince a court beyond question that the process was successfully practiced and known as such.

With your knowledge of the practical art, and in view

Concluded on Page 34

回乙产影亞細亞京 溫

Right—Mr Smith taking a close up of the elephant's feet as he plods along with his load of logs. Note the camera on the ground to the right of the elephant's trunk. Left—The patriarch of the herd disports himself in his daily bath. It is so convenient to be one's own shower bath

[Jack C Smith, A S C president of Asiatic Productions and now in Siam, getting material for a big wild animal epic, writes interestingly of elephants in his last communication from the jungle. Just now he is away on a Royal Elephant Hunt with the King of Siam, and promises some thrills in his next letter — Editor's Note]

Prae, January 22, 1929.

Mr. Silas E Snyder, Editor,
American Society of Cinematographers, Inc.,
Hollywood, Calif.
Dear Mr Snyder

I am enclosing a couple of stills that might be of a little interest to you. We spent a couple of weeks up in the teak forest and got some interesting stuff—photographing the industry from beginning to end, traveling back and forth each day by squatting for two hours in a dugout and being poled up the river, then walking three and a half miles through an elephant path. If we should happen to meet an elephant on the way, we just step aside into the brush and don't argue with him at all! The mountain sides are so steep here that the elephants use their trunks wound around a tree above them to pull themselves up.

A tree here is never cut unless it is one hundred feet high or more. The chief forester goes through and checks the ones to be cut, a circle is cut around the trunk quite deep and the tree left standing two to three years. After they are cut, the elephants drag and push them down the mountain side, or, if too dense a forest, drag them to the log chute they have built and send them down to the bottom. The elephants are harnessed to the logs and they are brought into the clearing at camp where the logs are all placed in line, one end of each log raised to keep them from rotting. When it gets close to the rainy season the logs are attached to bullock carts and dragged through the forest to the river bank where the elephants shove them overboard. As the rains start and the river rises they are sent merrily on their way to Bangkok and the mills.

They have six or seven trained elephants to handle log jams. It is a revelation to see those big, bulky animals feel their way on the logs, find the key log and push it out of the way with tusks and trunks so that all the logs can move on down stream. It takes two or three years to get them to the mills, for when the rainy season is over, the logs are left high and dry somewhere along the river until the next season. They usually figure from five to seven years from the time a tree is circled until it gets to the mill.

We photographed the taking a baby elephant away from its mother last week and it is quite a ceremony. A huge papa elephant—stands about twelve feet high—takes mamma miles away into the jungle so she won't hear her baby cry and keeps her there for five or six days.

In the meantime the mahouts take charge of the baby, who is the most stubborn individual imaginable. It takes three big elephants to get him pulled and pushed into the stockade made of heavy logs and chains. Then the owner anoints him with holy water; the tips of his tusks, which at his age of four years are about four or

Charles W. Herbert, A. S. C.

Charles W. Herbert, 221 East Evergreen Street, San Antonio, Texas, has been elected a member of the A.S.C. with the classification of News Cinematographer. Mr. Herbert has been field representative for Pathe, Fox and Paramount News, respectively; three times consecutive winner of Fox News Cameramen's annual contest (field division). Twice he received a $500.00 prize for first award and also contributed continuously to Pathe Review, Lyman Howe's Hodge Podge and Curiosities, also Fox Varieties. Of late he has been specializing in making small animal pictures; complete subjects for Field and Stream, Eastman Kodak Company and Bell & Howell Cine Libraries. Mr. Herbert has handled many commercial contracts in Florida and Montana and Wyoming, and made family library films for W. J. Bryan, Gar Wood, Thomas A. Edison, H. S. Firestone and Ruth Bryan Owen and F. S. Groves, Jr. He is adept at writing scenarios for commercial and educational productions and editing films. The A.S.C. accords the new member a hearty welcome

---

Mr. Len Roos, A. S. C., announces from Vancouver, Canada, that the Kinophone Sales Company has perfected and is ready to install a new synchronizing device for theatres of any capacity, the outfit selling for $650.00 f.o.b. Vancouver. The interesting part of the Kinophone is that Mr. Roos developed it, which proves that in the ranks of the A. S. C. there is talent capable of producing anything needful. The copyrighted sales booklet of Kinophone states that the company is ready to install any number of Kinophones.

---

five inches long, are sawed off and kept by the owner up to the time of the elephant's death.

The owner refuses ever to part with the tips, for it is a superstition that he may lose the elephant. Roast chicken and all sorts of delicacies are left near the baby as an offering to the Angel of the Forest in payment to her for taking the elephant from the jungle. The baby refuses to eat or drink and is kept in the stockade about a week or until he is thoroughly subdued. Then they take him to the river and the older elephants teach him to give himself a bath.

It is an education to watch them work. They have one old boy here who carries a trainload of logs down to the river on a little track, unloads the logs on the bank and takes the train back to camp without having anyone with him at all. He passes near where we are living every morning about 9.30 and goes on back about three in the afternoon.

The one picture enclosed was caught while I was taking a close shot of the elephant's feet as he was coming over the log path dragging his log up to place in line. The other is old man Chang giving himself a shower bath after a hard day's work

We just got word that we are included in the Royal Elephant Hunt which the King has ordered to take place next month—the first one in thirty-two years. They are giving us elephants with specially constructed howdahs to carry the cameras, and we expect to be out of communication with anyone for four to six weeks at least. It takes six days by elephant to get to where they expect to start the round-up with seventy-five trained elephants to do the catching, each carrying two mounts. They claim it is one of the two places left in Siam where an elephant hunt has never been made, so if we don't get some thrillers on this trip I miss my guess.

If it is possible to get anything out from there, I will do my best to send it to Mrs. Smith and have her send it on to you.

Just received the November and December issues of your good magazine and was mighty glad to see them. I kept the old lamp burning a little longer that night. Sound is certainly forging ahead fast apparently. I have wished many a time I had it with me for there have been many things well worth recording.

Best wishes to you and all the boys,

Sincerely,

J. C. SMITH.

Rosher in London

(The Bioscope, London)

Charles Rosher, A.S.C., who, as reported in our British Studio News last week, has just signed up with British International, is to supervise the cameras for A. E. Dupont's next B. I. P. production.

Mr. Rosher is a 100 per cent Britisher, who, in spite of a stay of nearly twenty years in U. S. A. and on the Continent, retains a refreshingly English accent.

It was in 1908 that Mr. Rosher first went to the States, and in 1911 he broke into motion pictures, though he admits that his early interest in films amounted chiefly to bobby.

Later he joined Mary Pickford, and among the films which he "turned" for her were "Daddy Longlegs," and later, "My Best Girl." In the interim he spent a period with Ufa, where he met Murnau, with whom he returned to Hollywood to photograph the big Fox production, "Sunrise," of which Murnau was, of course, the director.

Mr. Rosher, interviewed by a Bioscope representative, expressed the belief that there is a big demand for films based on big figures in British history. "Over there they love the pomp and ceremony, the costumes and pageantry associated with everything of the old English periods, and, if properly treated, I believe such subjects would go big there."

He was inclined to agree with a suggestion that British directors were apt, in filming such subjects, to sacrifice pictorial entertainment to unerring fidelity to tradition and historical fact, and he felt that in that respect American film producers had appeared to enjoy a distinct advantage.

He instanced First National's "The Divine Lady," in which the romance of Lord Nelson and Lady Hamilton is dealt with. This he regarded as a spectacle with all the ingredients of good entertainment, though he was prepared to concede that license had been taken with a lavish hand in the treatment of the story.

Mr. Rosher thinks there is a grand opportunity for British pictures, and holds that specialized story selection and treatment, coupled with advanced production technique, will do more to help forward our industry than a mere imitation of the old system of rendering all other considerations subservient to that of stellar appeal.

Film Studios in Great Britain

British International Pictures, 2 big studios and 2 new sound studios in process of construction, Elstree, 12 miles from London.

Gaumont Co., Ltd., Shepherd's Bush.

Gainsborough Pictures, Poole Street, Islington, London, N. 1

Ideal Films, Camden Town.

British Instructional Films, Welwyn Garden City, Surbiton.

British Talking Pictures, Ltd., Wembley.

Welsh-Pearson-Elder Films, Stoll Studios, Cricklewood.

British Screen Productions, Ltd., 2 studios, Worton Hall, Isleworth, Middlesex.

British & Dominion Film Corp., Ltd., Stoll Studios, Cricklewood.

New Era National Pictures, Ltd.

Archibald Nettlefold Productions, Walton-on-Thames.

Stoll Picture Productions, Ltd., Temple Road, Cricklewood.

Whitehall Films, Ltd., Elstree.

British Lion Film Corp., Ltd., Beaconsfield.

British Filmcraft Productions, Ltd., Wood Street, Walthamstow.

British Sound Film Productions, Ltd, Wembley Park

When It's Printed in "Variety"

IT MUST BE FACTS

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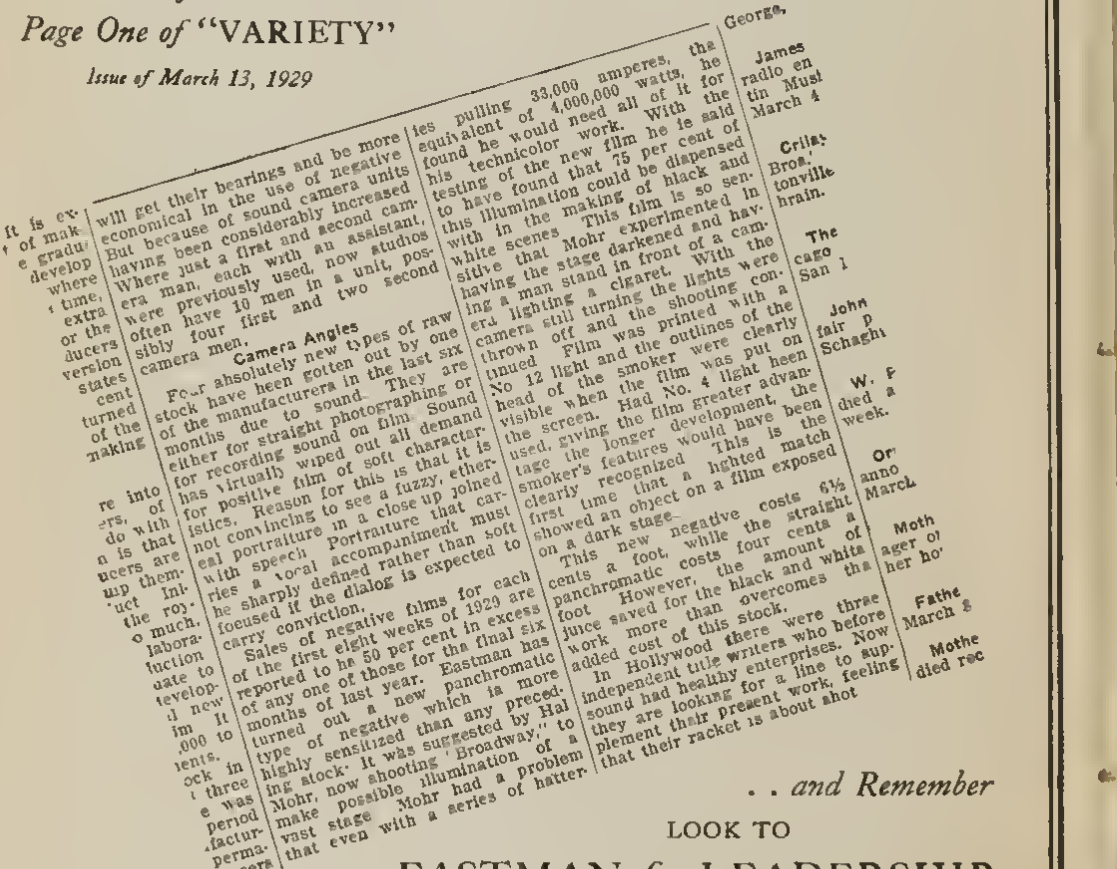
"WHAT SOUND HAS DONE"

. . . from . . .

Page One of "VARIETY"

Issue of March 13, 1929



will get their bearings and be more economical in the use of negative But because of sound camera units having been considerably increased Where just a first and second camera man, each with an assistant, were previously used, now studios often have 10 men in a unit, possibly four first and two second camera men.

Camera Angles

Four absolutely new types of raw stock have been gotten out by one of the manufacturers in the last six months due to sound. They are either for straight photographing or for recording sound on film. Sound has virtually wiped out all demand for positive film of soft characteristics. Reason for this is that it is not convincing to see a fuzzy, ethereal portraiture in a close up joined with speech. Portraiture that carries a vocal accompaniment must be sharply defined rather than soft focused if the dialog is expected to carry conviction.

Sales of negative films for each of the first eight weeks of 1929 are reported to be 50 per cent in excess of any one of those for the final six months of last year. Eastman has turned out a new panchromatic type of negative which is more highly sensitized than any preceding stock. It was suggested by Hal Mohr, now shooting "Broadway," to make possible illumination of a vast stage. Mohr had a problem that even with a series of batteries pulling 33,000 amperes, the equivalent of 4,000,000 watts, he found he would need all of it for his technicolor work. With the testing of the new film he is said to have found that 75 per cent of this illumination could be dispensed with in the making of black and white scenes. This film is so sensitive that Mohr experimented in having the stage darkened and having a man stand in front of a camera still lighting a cigaret. With the camera still turning the lights were thrown off and the shooting continued. Film was printed with a No 12 light and the outlines of the head of the smoker were clearly visible when the film was put on the screen. Had No. 4 light been used, giving the film greater advantage the longer development, the smoker's features would have been clearly recognized. This is the first time that a lighted match showed an object on a film exposed on a dark stage.

This new negative costs 6½ cents a foot, while the straight panchromatic costs four cents a foot. However, the amount of juice saved for the black and whites work more than overcomes the added cost of this stock.

In Hollywood there were three independent title writers who before sound had healthy enterprises. Now they are looking for a line to supplement their present work, feeling that their racket is about shot

. . and Remember

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EASTMAN *for* LEADERSHIP

J. E. BRULATOUR, Inc.

Edward O. Blackburn, Vice-President

HOLLYWOOD

Let Us Have Peace

By HOWARD E. CAMPBELL
Sound Expert United Artists

After reading and rereading "The War of the Talkies" in January, 1929, issue of **American Cinematographer**, I realize that Mr. Lawrence, its author, is sincere and some of his criticism constructive, else he would not have admitted in the subtitle "Sacrifice works both ways." However, instead of "sacrifice" he might have more accurately called it "modification of technique is required on both sides."

The following is offered as a possible clarification of the present situation and its apparently terrific problems!

To quote Mr. Lawrence: "The problem is easily located, therefore, in time, will be easily remedied. It is the one surprising fact that every blooming sound expert in the entire world is at present convinced that the only way to make satisfactory sound pictures is to sacrifice every other feature of value in Filmland to the proper recording of sound." Even if this were true, which it is not, unconvincing the sound experts would not supply the remedy. Apparently some of the motion picture actors, directors and cinematographers seem convinced that all it is necessary to do to make a talking picture is to substitute dialogue for titles, shoot the picture with finished silent version technique, and have the sound experts swing a lot of "mikes" around above the camera line, and record. They seem to think that enough microphones all "turned on" simultaneously will pick up all sound properly just like plenty of wastebaskets practically covering a floor will catch all the scrap paper dropped by a careless office force, or wafted by a capricious breeze.

Neither will a one-sided demand that "the sound experts will have to get in step with the motion picture fraternity; the latter will not abandon their maturity in an endeavor to crawl along on all fours with sound effects"—solve the problems.

Suppose, for example, that the motion picture industry with its present highly developed technique and art was suddenly called upon to go onto the so-called "legitimate stage" and shoot silent versions of stage plays. Then suppose the stage managers stipulated that the motion picture experts must "improve" their equipment and revise their methods so they could do a passable job of photography without changing one iota of stage action, lighting, actors' make-up, design and arrangement of sets, or set dressings, and, furthermore, that the cameras must shoot from some fixed side line so that the audience cannot possibly see them. Cannot you plainly hear the tremendous howl which would go up to high heaven from the cinematographers and picture directors?

But such a similar situation is exactly what Mr Lawrence is demanding of the sound engineers as witness: "The director of the sound picture of tomorrow is not going to cripple his players for sound registration. Not by a long shot! The director is going to move his people about according to the dramatic demands of his screen play—and the sound engineer is going to solve his difficult problem and collect the voices from any point on the stage. It is not known how they are going to do it, they have got to do it. Sooner or later this problem will be solved—and the sooner the sound experts eliminate their demand for sacrifice of action to permit them to collect the sound; the sooner they arrange to gather the sound from any position, the sooner the sound pictures will commence to be really excellent entertainment. Directors will have a lot to do with attainment of this highly desired condition. It is only a matter of time—and of fighting—until demands for sacrifices to sound recording provoke a devastating tidal wave of justifiable resentment."

If Mr. Lawrence thus correctly portrays the attitude of the motion picture industry, I should hazard the opinion that there has already been demonstrated entirely too much unjustifiable "resentment," and not nearly enough effort to understand the sound engineer's problems and cooperate with him to the utmost extent.

Only by cooperation and the acquirement of mutual understanding can the new art and the new technique be eventually developed which will turn out real entertainment without the slightest "sacrifice" on either side.

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Stereoscopic Motion Pictures

By MAX RITTERATH

So much has been written on the subject of stereoscopic motion pictures and so many experiments have been conducted that it is rather with hesitancy that one attempts to write upon it.

Max Ritterath

Stereoscopic motion pictures will never be created by a specially constructed camera or cameras or lens or series of lenses. It was surprising to read in the Los Angeles Times of Sunday, February 24th, 1929, on the front page "Films to be Realistic, Third Dimension Plan Born," by Herbert B Ives of the Bell Telephone Laboratories. Dr. Ives brings to life the old idea of projecting so that the images appear to the spectator as solid objects in space and this marvel he expects to accomplish by the use of about fifteen cameras with special attachment of moving lenses, etc, etc. Naturally Dr. Ives cannot be serious about such statements.

Projecting a picture on a flat surface, no matter how the lenses of the projector are ground or how many pictures are superimposed on the screen, may result in illusion, but at its best constitutes an insult to the nervous system of the individual. A highly sensitive organism like the retina is super-mobile, and yet today we ask the millions of theatre-goers to sit for hours in a theatre, permitting their retinas to be held in a practically stationary or cramped position viewing an image on a flat screen.

This will not happen when my own screen is used since it is based on other theories from my findings after careful research and is constructed mathematically correct.

Prior to working out this screen practically every conceivable way of creating stereoscopic sensation had been delved into carefully. I have even gone so far as to use four cameras perfectly synchronized and four projectors projecting the recorded images into a tank filled with a semi-liquid transparent substance only to learn of the explosion of another wrong theory. The subject of lenses has been covered from A to Z. Translucent screens with reflectors and two projectors have been constructed but we have to come back to the functioning of the retina and give to this organism a natural medium to satisfy.

We have to consider first that mechanism which receives and records the image: The human eye.

The eye is the most delicate organism in existence. Take, for instance, the condor who is able, from the highest altitude, to distinguish its prey among the rocks of the treacherous mountain slopes of the Cordilleras or the eye of a seaman which, on a clear day, distinguishes the masts and the rigging of a ship whose hulk is still behind the horizon.

Naturally we all recollect the comparison of the eye with the camera. I hope, in this article, to avoid that particular parallel since all my readers are familiar with this paragraph from previous readings. Instead I hope to explain my findings regarding the functionings of the eye in a plain and unacademic fashion.

Let us take a section of the retina and view it with ever increasing magnifications under the microscope and we shall find that we are just beginning to understand how far we still have to go in our research work to define the deeper functionings of the human eye.

We know that the retina consists of ten distinct layers delicately interlinked with a most marvelously arranged receiving and recording structure. The surface of the retina is formed by the fibrous system of the optic nerve. This layer is backed by successive layers of various structures until we come to the layer of rods and cones which are symmetrically arranged and which duly, by comparison and expansion, control the iris.

The functioning of the eye is mechanical—just like a beautifully constructed mechanism. A large amount of light coming from a brilliantly illuminated landscape or object will push with such force into the retina that the rods and cones are in turn compressed and expand and so relay the action to the muscles controlling the iris which closes down relatively to the intensity of the light radiations entering the eye. The iris is not an opaque structure like we use in a camera, the iris of the eye acts more like a retarding curtain. This expression must not be understood as meaning a filter since all the radiations, that is, multi-chromatic radiations, pass through the iris.

Now, how is the image received? For the answer to this question we follow the light from a source to the object and so to the eye and the result is very simple.

Light radiations, after leaving the source, strike the object; this retards the velocity of the individual rays, which, after being reflected, have to traverse the distance from the object to the retina. Those radiations striking the near surfaces of the object reach the retina with more force than those striking the farther surfaces. Therefore the image is recorded upon the retina in relief. From this observation I have concluded my theory which is that:

Light from the source to the object travels at uniform force, but reflected light reaches the retina with a force proportionate to the distance the various radiations have to traverse from the various points of reflection.

So, then, since the radiations from the points nearest to the retina press with greater force and so penetrate deeper into the retina than the ones from the farther points, we receive the imprint of a full plastic relief upon the retina instead of the sensation of a flat image as is now received when viewing an artificial image projected on a flat-surfaced motion-picture screen. Since, in stereoscopic projection, we are trying to produce, through artificial means, a natural phenomenon, we must thus thoroughly understand the laws governing the latter. Our eyes gauge far and near surfaces and objects simultaneously, the light radiations forcing the images into the retina as we have proven above.

I have analyzed a good many eyes and projected cross sections by the use of my light cooling cell, the eyes being taken quickly from an animal just killed and put into a freezing solution.

This discovery that reflected light travels at varying force and relative to the distance of the points of reflection from the retina, I claim as my own and this law furnished me with a basis for the construction of my stereoscopic motion picture screen.

This, I have accomplished by superimposing layers of network or a specially woven honey-combed fabric specially treated with light-reflecting substances of various densities which creates in an artificial way what the retina experiences in viewing a natural object. Thus is produced a very practical screen which creates the desired effect and is further proving itself by the total elimination of distortion and eye strain. In other words we have many far and near points of reflection, in projecting an artificial image upon such a screen, which constantly tend to change the surface tension of the human retina.

Foreign Activities of the Tonbild—Syndikat

The foreign patents of the Tonbild Syndikat (Tobis) have been acquired by an international combine to which belong American, French and Dutch groups. In order to guarantee successful working a continued exchange of experiences, informations, etc., will be cultivated and with regard to decisions of any importance it will be granted to Tobis an essential influence. It is proposed to establish national subsidiary companies in the different countries and to exhaust there the Tobis-Patents according to the experiences of the German mother-company. A mutual working will be assured by delivery of apparatus, exchange of programs, etc.

Howe Takes Vitacolor to the Orient

Not only has Vitacolor, a new system of cinematography controlled by the Max B Du Pont Vitacolor Corporation of Los Angeles, taken a powerful grip on the imagination at home, but its influence is rapidly spreading abroad, as was evidenced by certain occurrences during the past month.

When James Wong Howe, a Chinese lad who started from Hollywood's bottom-most ranks and climbed steadily upward to a position of eminence in the field of cinematography, sailed for Shanghai recently, he carried with him a Vitacolor-equipped camera and projector, and incidentally credentials as the representative of Vitacolor in the Orient.

James Wong Howe with Max Du Pont, A S C, inventor of Vitacolor

He intends, among other objectives which will carry him into the producing field in his own country, to make a Vitacolor picture of the transfer of Dr. Sun Yat-Sen's body from its present resting place to its million-dollar tomb atop a high mountain in China.

The transfer is being made out of reverence of the Chinese peoples for their first provisional president whom they declare was responsible, above any other person, for the overthrow of the old imperial government. The ceremony, says Howe, should prove one of the most colorful in the history of China. He is looking forward to bringing its beauty to the screen, down to the last ounce of color, through the facilities Vitacolor will provide for him.

Mr. Howe's departure for the Orient was looked upon by his fellow cinematographers as a distinct loss to Hollywood. With a university training behind him, he started as an assistant cameraman twelve years ago. Those dozen years have seen him expand and grow into one of the most expert cameramen in the film capital.

A week or so after Howe sailed, two more Vitacolor-equipped cameras were carried aboard a steamer bound for the Orient. This time, however, they were in the hands of government explorers who will visit Japan. Chosen, Manchuria and China to study new plant varieties, whose introduction into this country is expected to enrich nearly every agricultural section of the United States.

The expedition is in charge of P. H. Dorsett, veteran explorer of the United States Department of Agriculture, who has taken thousands of footage of film for his division. Loud in his praise of Vitacolor, he predicted that the next greatest advance in the educational work of his department would come from color cinematography. The addition of color to the films he will make on his present expedition, he said, will enhance their value by 500 per cent.

Vitacolor, however, is not an entire novelty in the Orient. The King of Siam, who received his attachments for 16 mm. camera and projector over two months ago, has been an enthusiastic Vitacolor fan since and has even gone to the extent of concocting his own developing "soup." Vitacolor is now represented in more than forty foreign countries.

Table of Filter Factors

Panchromatic negative film is being used so commonly and has been used so long, now, that any lengthy discussion of its advantages as compared with orthochromatic negative for use on ordinary sets is no longer necessary. The rendition of color is much less distorted with panchromatic than with orthochromatic negative. It is possible to use incandescent light for set illumination without using prohibitively large light units. This use of incandescent lights is of particular value in the case of scenes with sound records made at the same time as the pictures.

Panchromatic film has possibilities both for accurate and distorted color representation. It would take a rather large group of pictures to illustrate these possibilities and even then the representation would not be satisfactory without some rather definite idea of the colors in the original subjects pictured. No attempt will be made here to present such pictures or any full discussion of these potential possibilities of panchromatic film. Only through actual trial can a really satisfactory estimate of these possibilities be made.

As an aid to such trial, it is worth while giving approximate values for the filter factors needed with some of the more usual Wratten light filters. The accompanying table gives approximate filter factor values for the filters indicated with DuPont panchromatic. The body of the table gives the number of times the exposure should be increased from that required with no filter to that required for exposure through the filter when the scene is illuminated by noon sunlight or by light of equivalent color value, such as some arcs give but which incandescent lights do not give. It should be noted here that the incandescent lamps produce light rich in red and low in blue which by itself serves to correct very largely distortion of color rendition caused by panchromatic film itself and hence makes a correction filter practically unnecessary, though for some special cases filters to alter relative contrasts are needed.

Table of Filter Factors

Filter Factors for Certain Wratten Filters Used with DuPont Panchromatic Film and Scenes Illuminated by Noon Sunlight.

Filter No.	Name or Letter	Color	Filter Factor
3	Aero No. 1	Light Yellow	2
9	K3	Yellow	3
15	G	Deep Yellow	3.5
25	A	Red	6
29	F	Deep Red	8
70	Contrast R	Very Deep Red	64

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Recent Releases of A. S. C. Members

"Hearts in Dixie," Fox	Glenn McWilliams
"The Girl on the Barge," Universal	Jackson Rose
"Interference," Paramount	Farciot Edouardt & Roy Hunt
"The Wolf of Wall Street," Paramount	Victor Milner
"Vagabond Cub," F B.O.	Virgil Miller
"Object, Alimony," Columbia	Joseph Walker
"Cheyenne," First National	Frank Good
"The Spirit of Youth," Tiffany-Stahl	John W. Boyle
"Hey, Rube," FBO	Robert Martin
"Noah's Ark," Warner Bros	Hal Mohr-Barney McGill
"Lady of the Pavements," United Artists	Karl Struss
"The Passion Song," Excellent	Andre Barlatier
"Speakeasy," Fox	J. A. Valentine
"His Last Haul," F. B. O.	Philip Tannura
"One Man Dog," F. B. O.	Robert DeGrasse

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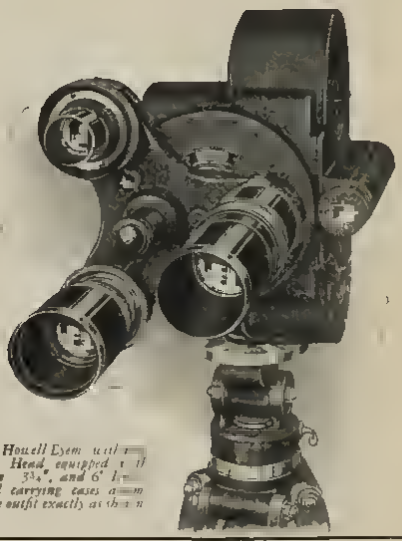

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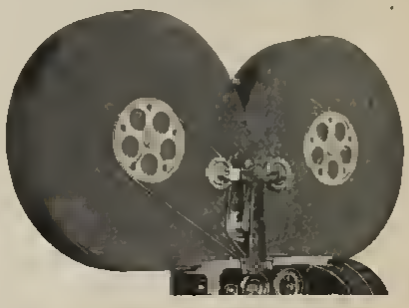

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Putting the Light Where You Want It

It has been a source of surprise to many who have become interested in the use of MAZDA lamps for motion picture photography that lower wattages are generally employed on the sets lighted with incandescent lamps as compared with those on which other illuminants are used. This is due to a large extent to the ease with which the incandescent source lends itself to the design of lighting equipment which directs the light where it is needed. Ample light is thus provided at lower wattages.

A comprehensive study of the general lighting requirements of motion picture sets shows that a sixty-degree horizontal spread of the light from both the floor "broads" and the "scoops" is desirable. Equipments which spread the light over an angle materially greater than this not only waste much light but make the adjacent walls and surroundings unduly bright, and thus require the erection of light shields. If the distribution is much less than about sixty degrees, the general illumination of the set either becomes spotty and difficulty is encountered in securing uniformity of illumination, or a larger number of units are required to gain the desired uniformity. It is likewise found that a sixty-degree vertical spread of light is most desirable. This makes possible the use of a symmetrical reflector unit which is fortunate from the standpoint of cost, high light utilization, and accurate control.

The curve marked "High Efficiency Unit" on Fig. 1 illustrates the candlepower distribution of a reflector which meets the above requirements (the lines OA and OB mark the sixty-degree spread). This light distribution can be obtained by a reflector of the general contour shown on the second graph.

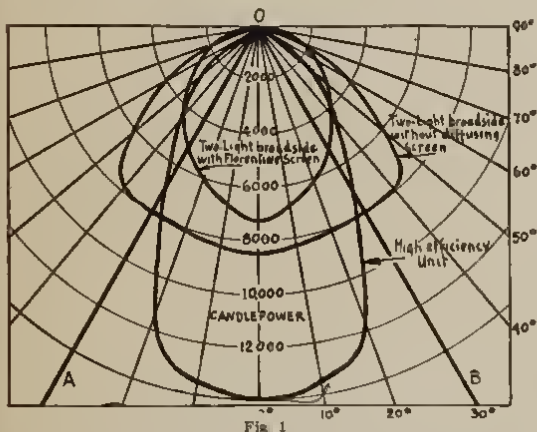

Fig 1
CANDLEPOWER DISTRIBUTION DATA OF GENERAL LIGHTING EQUIPMENT
Two-light broadside using two 1000-watt PS 52 bulb lamps with and without Florentine glass diffusing screen Single light high efficiency unit one 1000-watt PS bulb lamp

Desirable materials for a reflector for this service are semi-matte finished aluminum, and stippled or rippled glass. The aluminum has the advantages of high efficiency, low first cost, and light weight; in practice, the surface requires re-treating at intervals to maintain its reflection efficiency. Reflectors of mirrored glass have an equally high efficiency, a greater first cost and weight, and are subject to mechanical breakage, but they have the advantage that the reflection efficiency is practically unimpaired with them, and the surface of the reflector is readily cleaned by washing

The reflector of Fig. 2 uses a single PS-52 bulb (pear-shaped) lamp and the candlepower output illustrated in Fig. 1 is for the 1000-watt lamp. The other two curves on this figure illustrate the light output at various angles of a conventional broadside unit lined with white enameled steel and using two 1000-watt PS-bulb lamps, in which no effort has been made to direct the light where it is most useful. The outer curve shows the light distribution without the usual Florentine screen. It will be observed that much of the light is directed into areas where it is of little or no use. The inner curve illustrates the light output of the same unit with the usual Florentine, and is the one which should be compared with the high efficiency unit since the Florentine glass must always be employed with the usual broadsides. The high efficiency

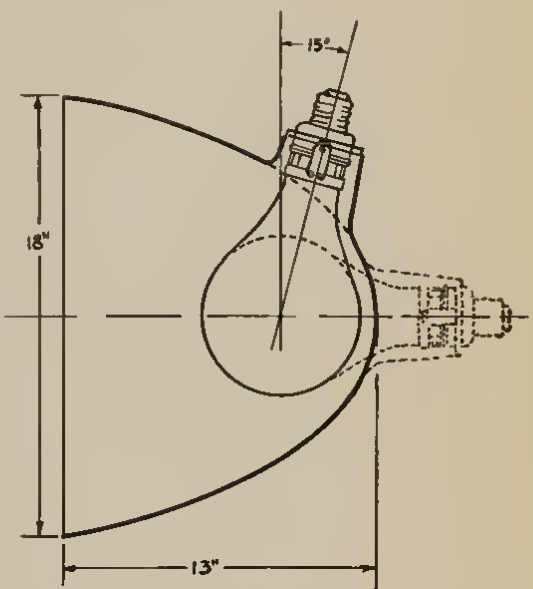

Fig 2
To obtain maximum life from the PS bulb lamps, they should be operated approximately base up. The lamp position indicated in full lines is recommended when the reflector is employed as a floor unit or scoop When the reflector is used in domes or other overhead units, directing the light nearly vertically downward, the broken line position should be used. In case the reflector is to be made of matte-finish spun-aluminum an accurate drawing with complete dimensions can be obtained from the Engineering Dept. National Lamp Works of G E Co., Nela Park, Cleveland, O. The dimensions shown are only approximate.

unit directs about 40 to 45 per cent of the light output of the lamp within the sixty-degree angle, while the twin broads put only 12 to 15 per cent of lamp output within this same angle. It is evident from this why it is possible to obtain nearly twice the quantity of light on the set with only half the wattage when the proper equipment is substituted.

The 1500-watt and 2500-watt PS-52 bulb lamps have the same physical dimensions as the 1000-watt lamp, and they may be used in the reflector, when an increased volume of light is desired, without altering the light distribution. Lighting directors will find the reflector illustrated has a satisfactory distribution when used in place of the usual scoops. It will, of course, be necessary that the reflector mounting permit the reflector to be aimed at an angle of from 30 to 45 degrees downward. Three or more of these reflectors may be grouped together and supported from a single suspension device, making an excellent dome or overhead light unit.

Since it is a function of the general lighting equipment to provide an even illumination free from modelling effects, most lighting directors employ the Florentine glass diffusing screens in front of the broadsides and scoops to obtain a more uniform light source of large area. While these Florentine screens are fairly effective in reducing the pronounced shadows, they absorb approximately one-third of the light. A reflector of the type recommended for this service is nearly equally bright over its entire surface when viewed from any point within its spread, and thus satisfies the requirements of a smooth light source of large area, eliminating the undesirable shadows and making the use of diffusing screens, with their attendant losses, unnecessary.

Amateur Studio Picture

An S. M. P. E. Transaction Read at Lake Placid, and Published by Request of Amateur Readers

[This paper read first at the Lake Placid Convention of the S.M.P.E. is reprinted at the request of amateur producers of short subjects It will be both interesting and helpful to our amateur motion picture maker friends, an increasingly large number of whom are reading THE AMERICAN CINEMATOGRAPHER *—Editor's Note]*

By J. S. WATSON, JR.

A great many people have said recently, and some of them may have believed it, that the artistic future of the motion picture was in the hands of the amateur. They were, of course, using the word amateur as an antithesis to everything bad in professional practice. The word professional can be used outside of its proper meaning either as a compliment or as an insult, either to designate seriousness of purpose and knowledge of means, or on the other hand, standardization at the expense of feeling, perfunctory haste in production, and callous and inappropriate imitation of known commercial successes. But really there are only three kinds of pictures, good, bad, and medium. Everyone has seen bad films with plenty of the latest professional surface glitter and good films in which every drawback known to photography has not upset the well-conceived plan or the good luck of the director. Certainly what is called the amateur spirit, the desire for sincerity and freshness of treatment, is not incompatible with a professional desire to have your film a success. More good amateur films have been made by professionals or semi-professionals than by strict amateurs, the strict amateurs having only the one slightly disheartening advantage that their films do not have to be cut up and titled by ill-disposed distributing organizations.

In November, 1926, Melville Webber, a painter and archaeologist told me that he would like to try his hand at sets for a photoplay. We had an empty stable, plenty of wall board, and 12 KW of direct current, but neither of us felt able to write an original story. We finally selected Poe's "Fall of the House of Usher" which neither of us had read for 10 or 15 years, and which we therefore felt all the more able to treat as raw material. The liberties which we have taken with the story, although hair raising, are not unprecedented in the annals of the motion picture industry. They will be explained later.

Aesthetic Theories

We suffered from the pseudo-scientific prejudice, the essence of modernism, which makes people believe that each medium of expression can and should be isolated and purified just as a chemical compound is isolated in the laboratory. You say to yourself that the cinema is not theater or the dance, and certainly not the novel, and then you begin to wonder what it is. You think of camera tricks as essential, of oppositions of movement, changes in size, changes in lighting and sharpness, accelerations and contrasts of speed, distortions of shapes and perspectives. You decide to play any number of tricks on time and space. Then you remember that the worst picture you ever saw had all of this and nothing else; that every possible trick was invented the same year as the camera; that ideas have nothing to do with art and there are too many ideas anyway.

But just the same, suppose one could take the old tricks and use them not only to illustrate the story, as double printing is used to show Pharaoh in the Red Sea, but to improve the flow of the picture, gathering force from scene to scene, so as to make the spectator feel not with any particular hero or heroine as one does in a cheap novel, but to make him feel the whole piece like a piece of poetry.

Practical Difficulties

Thus far our aesthetics would have affected our procedure no more than a list of good intentions. The cumulative effect which we hoped to get is the most important effect produced by any first class picture no matter how little the average spectator may be aware of it.

We went on, however, to a thought which has occurred before to a great many people, namely that the crucial point in a motion picture is the point where one scene changes into another. There is not only the action to be made coherent, but also there are matters like speed, composition, and photographic quality which must not be suddenly interrupted without good reason. An inappropriate change of scene is probably much more serious than an illogical sequence of ideas in writing. Scenes to the sensitive eye frequently appear to annihilate one another, and a picture in which this occurs repeatedly, however meritorious it may be from other points of view, will give you a headache.

In feature pictures these transitions from scene to scene are supposedly taken care of by the director and the photographer and what escapes them has to be looked after by the cutting department. We decided to eliminate the difficulty once for all at the very start Our first scenario called for continuous action during 1000 feet of film. This was to be accomplished mainly by keeping the camera moving from one part of the set to another, photographing successively wheels, doors, windows, actors, and pieces of actors. Anyone who has tried to make a sequence of lap dissolves in the camera will know how difficult it is not to be able to cut the film. And this sequence did not permit even dissolves. We had taken about fifty feet of it when somebody made a mistake. It appeared impossible to recapture the exact position and pose. We began over again and only got to thirty feet. After spoiling a good deal of film, we settled down to the cross reference system of the ordinary feature, where you jump from the cellar to the attic, and where the hero lights a match in a long shot and throws it away in a close-up.

Scenario

In "The Fall of the House of Usher," the plot is of little consequence; the importance of the piece lies in its mood—in a development of emotional tone almost without action. We decided to make a picture with a mood rather than a story. It became clear at once that for this the literal representation of a sequence of events in time would not be appropriate. The characters and their relations to one another became thematic material, in the organization of which movement and progression were essential. For example: The visitor to the House, the I of Poe's story, has been used as a motive, running (often literally) through the whole picture and supplying a key to the arrangement, which falls into three main divisions.

In the first part he is seen entering the house, becoming affected by the weird atmosphere of the place, and gradually being subordinated until only his hat suggests his presence.

The second part has to do with the Lady Madeline of Usher and her brother Roderick, her fall into a cataleptic trance, her entombment (which is represented as a mental submission) and subsequent escape from the burial vault, and the effect of all this on her brother's mind. In this episode the visitor is suggested shortly after the burial by the shadow of a hat on the wall and again by a more definite recurrence of the hat.

In the third part the sister and the mad brother destroy one another and the house falls. At this point the hat becomes the visitor again, and he flees from the scene of destruction.

Clarence Brown, directing LEWIS STONE *and Dorothy Sebastian in a scene from the new Metro-Goldwyn-Mayer picture, "A Woman of Affairs"*

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Fig. 1 Double exposure, large head moves forward background retreats (Working drawing from the scenario).

Effect Scenes

As for our very numerous trick, or more properly (since there is no attempt at deception) our effect scenes, probably not one of them is new or even fresh. I think, however, that by a digression I can show why they seemed to us to be an important and even a necessary part of our picture.

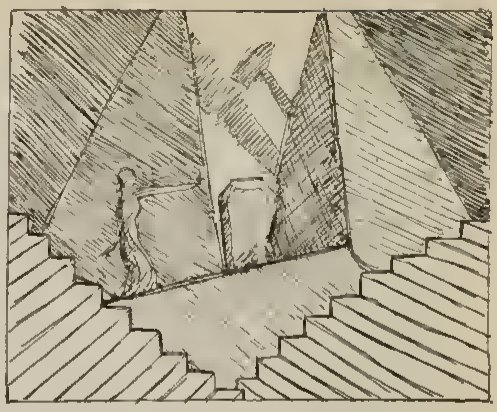
Several years ago a member of the Society of Motion Picture Engineers stated that the motion picture was not then an art and probably never would be, but that theatre presentation with colored lights, music, and personal appearances was certainly an art and a very important one. To this another member replied that if the Broadway prologue is an art, the motion picture ought to be happy to remain an industry. . . . In spite of which, the word "art" continues to be used by almost all the speakers at motion picture banquets.

Now without getting involved in metaphysics one can perhaps say that an art is quite simply a means by which the human spirit expresses itself. Action is also a means of expression, but imperfect and at the mercy of circumstances. The artist prefers colors, words, or sounds, over which, with practice and talent he gains a wonderful and intimate control. The perfect example of an art medium is modeling clay. The artist can actually feel his idea take shape, and if he does not like the feeling of what he has done he can change it immediately.

As an art medium, the motion picture lacks plasticity, sharing a great many of the drawbacks of war and politics. You take advantage of happy accidents and use your ingenuity to cover up unhappy ones. The animated cartoon is about the only sort of picture over which the worker has really intimate control.

In studio pictures, a moderate degree of control is exercised by the professional director, and this is obtained mostly in the set. The scenery is built, with or without miniatures, and lighted, the actors trained, and the results transferred as directly as possible to the screen. A few years ago the directors were so pleased with their results that the camera came to be looked upon as a mere recording instrument and it was generally believed that effect photography as such was unworthy of a part in the making of a serious picture. Lately, due to the popularity of films like "The Last Laugh," effects have come back. Half of our feature pictures are now decorated with "musical" sequences of lap dissolves which threaten to last the rest of the evening.

Nevertheless the professional photoplay continues to aim primarily at story interest put over by realistic pantomime. The flexibility of the medium continues to depend on the expertness of actors and on the ability to manipulate realistic settings. Control over details of the latter sort is obtained as a rule only at great expense. The careful lighting of a drawing-room 30 ft. high and 100 ft. long, even though half of it is painted on glass, is quite beyond the amateur; yet this appears to be exactly



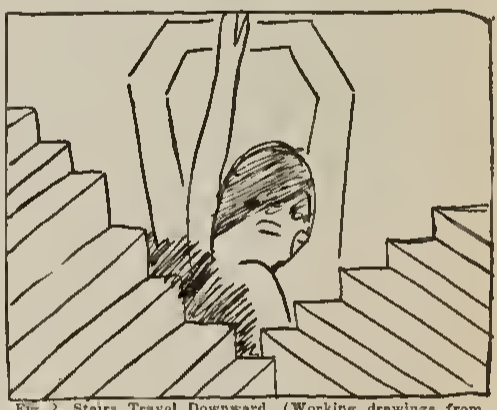


Fig. 2. Stairs Travel Downward. (Working drawings from the scenario)
a Beginning of movement
b Later phase of movement

the sort of clay in which the professional director is working.

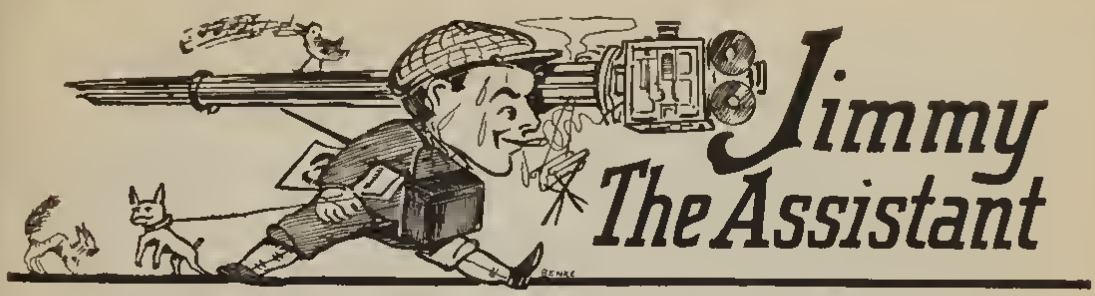
It is necessary then for the amateur who wants to make a studio picture which shall exploit the wonderful possibilities of studio lighting and of screen acting, to content himself with even less control than is anjoyed by the professional director? Not at all. Although he cannot afford the expensive control of the setting, there is another and surer method of control, the possibilities of which have scarcely been touched. I refer, of course, to camera and printer control, which the professionals use for economy, or safety, or for a laugh, or to jazz up a dull sequence, but which could be used just as readily for serious purposes.

I do not suggest that the amateur undertake the enormous labor after realistic effects of the professional trick department. The important thing for the amateur is that the medium be flexible, not that it be realistic. One should be able to control the rhythm of a sequence in space and time, and then if the sequence has not exactly the right feeling, one should be able to change it in the darkroom. The more control a medium permits the better art medium it is, and in this respect a pencil still has it all over a camera.

Scenery

In "The Fall of the House of Usher" we started with painted scenery, but we have come more and more to depend, for effects of depth and weight on surfaces of plain cardboard broken with moving prisms and tinted with light. We have also used the familiar slow, stop, and reverse motion, multiple exposures, and double printing. Shadows naturally appeal to the amateur as being

Concluded on Page 33



LABORATORY TECHNIQUE—1914

Every time I go into a modern lab it reminds me of the old time labs I used to work in, because they're nothing at all alike.

It used to be that no place was considered even possible for a lab unless it was dark, damp, dismal, and utterly air-tight.

You got into the place through a door that slid up like a curtain. The door was made good and heavy, so as to keep out lots of light, and was worked by a counter weight held by a string running over a pulley. Sometimes these strings broke. If you were inside you were marooned and had to live off your shoes until a relief party came to the rescue. If you were under the door further proceedings didn't interest you any more. There was a guy seen somebody get caught in one of them things, once, and he went right out and patented a new gopher trap that has made him rich. It used to be that lab workers couldn't take out insurance on account of them doors. They still call any door leading into a lab a 'trap' even though the old-time dead-fall has been abolished.

For some weird reason they always painted the inside of every room black. They used water color mixed with glue that the painter couldn't stand any more—and if you know anything about the constitution of an old-time scene-painter you know that I'm not talking about Lilies of France. The idea of using water color was so that when you touched it with your wet hands it would come off. I don't know why.

Instead of floors there were raised gratings. That was so that anything that spilled could lay on the floor for a while until there was enough of it to run off of its own accord. Washing tanks just run over on the floor. That made it nice and damp inside, always. Ventilation was unheard of. The average lab worker of that day didn't know how to pronounce the word, much less spell it. He'd never heard of such a thing, anyway. His idea of fresh air was something that wasn't in labs.

Together with the hermetical sealing and the overflow of water and solutions and what-not on the floor always, the inside of the old-time lab was the pneumococci's paradise and the original breeding ground of the deservedly popular flu-germ.

But you can get used to almost anything; and the old-time lab worker didn't mind it a bit. In fact, he got to kind of like it. After working all day in a rich atmosphere loaded with the sighs of many a friend and companion, and in a darkness that was so thick and deep and real that you could bite bunks out of it and chew it like gum, the weak and pallid air of the outside seemed flat and flavorless by comparison, and hardly worth breathing.

As I said, any old place that was dark would do for a lab. I've worked in basements, in old dance halls, in bungalows—any place that could be sealed up good and tight. Sometimes there were separate rooms for the different operations, like in the bungalow, where we developed negative in the front bedroom, positive in the back bedroom, chemicals in the kitchen, printing in the dining room, titles in the broom-closet, and everything else, including drying drums, cutting-room and stills in the living room; but of course, that was a swell lay-out, and not what we were used to. It used to be that we would mount the old step printer right next to the positive soup where it would be handy; but of course, you had to be careful not to slop hypo into the box that caught the positive as it squirmed down out of the printer. There wasn't anything startling in having everything, including the perforator, all in one room; and the idea of having more than one guy and a helper to do the whole business is comparatively modern.

He used to manage his work just like an efficient housewife manages her housework—or used to.

The morning was given over to negative work. We'd start in bright and early and put five gallons of water on to boil so as to be able to dissolve the ortol. Mix up the soup, dump some more hypo crystals into the hypo tank, take the negative into the room, close the dead-fall and bid farewell to the bright world for a while. By noon the day's output of the studio—800 or maybe 1000 feet, on heavy days—would be sufficiently hard-boiled and dense enough so that everyone would feel satisfied that they'd got their money's worth of silver out of the film. Put the stuff to wash and take off the previous day's work from the drums. After lunch the negative just cooked could go on the drums to dry and then the problem of how to burn enough light through yesterday's negative so as to get a print from it would be taken up.

The negative soup would be dumped and positive made. The difference was that you used metol instead of ortol, and put in lots of sodas—plenty of carbonate so as to get good thick blacks. Printing then commenced and as soon as the positives were printed and developed and washed and put on the drums it was called a day. And a darned good day, too—all of 2000 feet of stuff handled.

Most places didn't bother with positives, though. It was considered effeminate, or something, for a director to have to see positive projection. In them places all you had to do was to boil up a good stiff negative and hand it to the cameraman to project. I shudder, now, when I think of what used to happen to them negatives. They generally used any old machine that couldn't be used in the theatres any more on account of chewing the film all up; and would run the negative time and time and time again.

Poor old negative. It used to see a hard time. It's handled now with more care than as if it was made of butter; but it used to be treated like it was guaranteed indestructible, with every guy trying to bust the guarantee.

For one thing we used to use pin racks. Now pin racks is lots of fun for a while, but that's about all. You wind the film round and round, from the center out, on metal pins. Then you souse it into a flat tank of soup. The first thing that happens is that the film gets wet, stretched, and slides calmly off in a nice wet circular coil resting on a lot of sharp points. Getting that film back on again is a good job for a nervous guy with hot hands. After that you stretch rubber bands along the points, which helps.

Now then, after—and if—the film is developed and fixed and washed without falling off many more times, you have the problem of getting the film off the rack and onto the drum. Theoretically you were supposed to let the film dry on the rack. Well, we tried that—and weeks elapsed before we got the stuff unglued from itself. It wasn't worth the effort. Some places had the emulsion glued to the back of the next film, giving a pretty but useless double exposure effect, and other places had no emulsion on at all. It made a very spotty print.

We had to get the film on the drum. So we worked in pairs, one guy holding the rack at present arms by means of an ice pick thrust through the center, and the other turning the drum and running the film through the official shammy. At first it goes easy. The film goes on

Continued on Page 24

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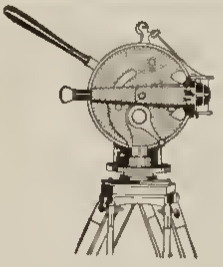

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Patents vs. Patents vs. Practice

By CARROLL H. DUNNING

Most of my time is spent in studios co-operating with technicians producing composite photographic shots, but I still find an interest in the study of Patent practice.

As I understand it one of the fundamental rules of Patent Law is that the lesser covers the greater. In other words, a repetition, or succession of the same methods is not a patentable improvement over a patent already granted for the single method.

It is true that motion pictures require, generally, more complicated processes and operations and the methods therefore are often patentable inventions.

But where the steps or operations are identical with those covered in an older patent for still photography, then the latter dominates. In such cases, a so called motion picture is taken at its face value, namely: just a succession of still photographs.

A proof of my contention is the Patent Office practice of frequently citing still photograph patents against new motion picture applications. I have before me the file wrapper, or Patent Office record of a recent motion picture application. In it the authorities name a prior still photograph patent and reject the motion picture claim for that reason.

To proceed with the subject before us, let us say that I am called upon to effect photographic images of a photograph of a set or scene on a negative, and effect photographic images of actors and properties supplementing the same, the images of the photograph (background), being photographed at such a point in the range or field of view of the camera as to be relatively small and properly merge with the field covered by the living actors; all of this being done simultaneously or successively.

I will cover at least four ways of doing it, namely:

1. I can follow word for word the dominating claim of U. S. Patent No. 1,053,887 applied for on March 4, 1912, and issued to Hugo Sontag on Feb. 18, 1913, simply by replacing the still camera for a motion picture camera and using a "projector apparatus" as called for in the Sontag patent and I will perform the exact operation of the Sontag claim.

By repetition I will produce a succession of still composite photographs, which you and I call motion pictures And it will all be done simultaneously, projectively and directly. This patent expires next February and if someone will hurry and find Sontag, they can enjoy the exclusive privilege of operating by this method for the few remaining months. In 1912 he was a subject of the German Emperor, residing at Erfurt, Prussia.

2. Or I can follow the operations called for in the dominating claim of U. S. Patent No. 858,162 applied for on December 6, 1905, and issued to F. J. Dischner on June 25, 1907. By this method the work would be done successively and directly. If my ability to do this is seriously questioned, I will be glad to take any background negative selected by the Motion Picture Producers Association and under the supervision of a member of the A. S. C., make a practical demonstration of combining actors therewith. To obtain a satisfactory commercial result, however, I will be compelled to utilize and infringe new improvement patents now in force. The Dischner patent expired five years ago and is now public property. Assuming that with the aid of modern accessories, the methods described are workable, as I have stated, then they seem to cover a broad interpretation of the expression, "effecting a photographic image of a photograph and effecting a photographic image of actors and properties supplementing the same, etc." Therefore, it behooves the subsequent inventor to limit his claims to some specific improvement or he may find in a civil action that by "having claimed much he will retain little."

3. To produce a composite photograph I might attempt to follow the method of reflecting a background scene into the path of the lens while photographing real actors, as illustrated by Dawley. His U. S. Patent, No. 1,278,117, was applied for August 17, 1914 and issued

Concluded on Page 35

The Gall Patent

[In accordance with its policy of "keeping the records straight" and of clearing up erroneous ideas in regard to patents, claims and purchased rights appertaining to motion picture photography the AMERICAN CINEMATOGRAPHER *herewith presents excerpts from "Motion Picture Printing Mechanism,' U. S Patent No. 1,197,732, of date, September 12, 1916, application filed May 22, 1912, granted to Adolph F. Gall, West Orange, New Jersey. Mr Gall was for many years associated with Thomas A. Edison and was the inventor of many motion picture devices. This patent is vitally important to motion picture producers as it confers rights upon the patentee which apparently gives the original basic Principles of the* MOTION PICTURE PROJECTION PRINTER *and also of the* AUTOMATIC SHUTTER DISSOLVE, *both of which have been almost generally utilized by motion picture technicians in the studios and by many manufacturers.*

Only excerpts descriptive of the salient points of the patent are here presented, because of lack of space. A complete copy is on file in the office of THE AMERICAN CINEMATOGRAPHER.*—Editor's Note.]*

**** By "original sequence" I mean the order in which the pictures are originally taken, in the motion picture camera. This usually is such that the first picture is adjacent the sky line of the second picture, the second picture is adjacent the sky line of the third picture and so on to the end of the negative. By "reversed sequence" I mean a sequence of pictures which is the reverse of the "original sequence" the position of each picture in reference to the axis of the film being unchanged. Thus, if the original sequence is the one I have just described, in the reverse sequence, the first picture is adjacent the ground line of the second picture, instead of the sky line of the second picture, the second picture is adjacent the ground line of the third picture, instead of the sky line of the third picture, and so on throughout the strip. I have devised the mechanism which I am about to describe as a convenient means for producing negatives in "reversed sequence" although such mechanism is capable of other uses, as will be apparent to those skilled in the art. In producing such a negative in "reversed sequence" it is desirable to have a printing machine in which a positive may be made from a negative in "original sequence" and, when this positive is developed and dried, in which a negative may be made therefrom. I prefer to accomplish this printing by what is known as the projection method, in which the light, after passing through the negative film, passes through a lens before it reaches the sensitized surface. When this projection method is employed, if the negative film and the sensitized surface are moved in opposite directions, the sensitized surface will be printed in the same sequence as the negative, and on the other hand, if the two films are moved in the same direction the sensitized surface will be printed in "reverse sequence."

In using the apparatus which I am about to describe, it is obvious that in order to produce a negative in "reverse sequence" it may be done either by printing first on a sensitized surface with the fims moving in opposite directions, and then printing from the positive film made by this first printing with the films moving in the same direction, or by making the first positive print with the original negative and the sensitized film moving in the same direction, and the second print with the first positive print and the sensitized film moving in opposite directions. It may also be desirable at times to move the sensitized surface in a plane parallel to that of the negative, but in a direction other than parallel to the direction of motion of the negative film. For instance, if it is desired to produce a film in which the pictures, instead of lying with their sides parallel to the edge of the film as is usual, have their tops and bottoms parallel to such edge, it may be done in my novel mechanism by moving the sensitized film in a direction at right angles to that of the negative film. It is also desirable in any printing apparatus that it be so arranged as to be operated in the light as much as possible and with my novel mechanism I accomplish this end also. It is also desirable that a printing machine, particularly of the type which I have illustrated, shall be provided with a shutter, the exposure opening of which can be regulated. It will be understood that the time of exposure in a printing machine having the usual rotary shutter is controlled by the speed of rotation of the shutter and by the size of the opening. My printing machine is intended to be operated at a constant predetermined speed, although it is possible, of course, to change this speed at any time desired.****

**** A rotary shutter is shown mounted on a shaft and connected through suitable gearing with the mechanism which drives the film moving sprockets, and therefore operating in unison therewith. This shutter may be of the ordinary rotary type having a segment removed therefrom to provide an exposure opening, and it is preferably placed between the end of the trunion and the exposure opening. It may be placed in various positions, however, other than the specific one shown The position in which I have shown it, however, is the preferred one, since it there acts practically as a focal plane shutter.

Power to move the various parts of the sensitized film moving mechanism is conveyed through a shaft connected through a splined sleeve to the shaft driven from the negative moving mechanism. The sleeve is provided so that the mechanisms may he moved toward and away from each other.****

**** Now when the mechanism is started the film from which the print is to be made on the sensitized film will move step by step in opposite directions and the print will therefore be made in "original sequence." In order to allow the frame to turn easily in the hearing, the handle is operated to unclamp the trunion and after the frame is in its new position the trunion is again clamped by moving the handle. While I have shown two positions for the frame, it is obvious that if it is desired to print a film in which the pictures lie longitudinally of the film instead of cross wise, the frame will be turned through 90 degrees only, in which case the negative and sensitized films will move at right angles to each other and produce pictures either in "original" or in "reerse sequence," according as the sprocket is at the right or hte left of the center of the lens mount.

I have illustrated a special type of shutter which I find useful in connection with my printing machine just described. The shaft rotates in a bearing and another not shown, each supported by the frame. The shaft is hollow and has a second shaft loosely mounted therein and projecting through the hearing. The sleeve shaft has a hub attached to the inner end thereof, and the collar attached to the opposite end thereof, and is also provided with the gear meshing in gearing connected to the driving gear The inner end of the shaft is provided with a hub and the outer end with a knurled collar. The spring in a hollow in the collar produces end pressure between the hubs to hold the shafts in adjusted position. The shutter proper is made up of three blades. Each blade is a circular disk with a sector cut away leaving an outside ring and a solid sector or blade extending to the center.

****The blade is fastened to the hub of the shaft and will be rotated, therefore, relatively to the blade when the knurled collar attached to the shaft is turned.

1 In a motion picture printing machine, a lens, means to move a motion picture negative intermittently across the optical axis of said lens, means to move a sensitized film across said axis and in a plane parallel to the plane of motion of said negative, and means adapted and arranged to control said last named means, so that the latter may move the sensitized film in any desired direction with relation to the direction of motion of said negative.

2 In a motion picture printing machine, a lens, means to move a motion picture negative intermittently

Continued on Page 23

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Who are the motion picture wizards that make mountains out of mole hills, raging torrents out of dump tanks, who make ships to sail where there are no seas, snow slides to work devastation where there is no snow nor any mountain and who can make the terrible Mount Aetna to belch forth world destroying rivers of fire and lava ten thousand miles from where the volcano really exists.

Who made "Noah's Ark" possible of production as a convincing spectacle of cosmic forces in action—certainly not the story writer, nor the director, nor the actor folk, though all these did their work well enough—for all these latter elements function in every picture, but the miracle worker is not so often in evidence.

In the legitimate publicity of the studio he is given no place. Hidden away from the spot-light he performs his work of wizardy unheralded, unsung and unknown even, except among his kind and in that realm of science which must ever remain a mystery and a terra incognita to the motion picture fan.

Wonderful stories could be written of these men and their works—the most wonderful that ever came out of the motion picture industry—but they must not be told lest the "secrets" broadcast to the world might take the glamour from the screen.

The editor holds this to be a false view, but then editors are not supposed to know what would interest a movie fan and, also, the editor does not wish wantonly to place in jeopardy his hide.

But fancy a "Noah's Ark" without the magic of the special process, trick and miniature operatives. The picture simply could not have been done, for these operatives in motion picture technique deal only with the so-called "impossible." In brief, if it really is impossible, the special process men do it. They are not interested in things that can be done. The finished work of these men is all that can be written about, because of the mandates issuing from the studios forbidding description of their methods and, as the method is the particularly intriguing thing about this sort of work, all that is left for the writer is to generalize, and generalizations are usually tiresome.

Someday somebody will wake up and find out that the MAKING of a motion picture is the most interesting thing about it. The story is yet untold.

However, a word about the men who do these things is not taboo and, in this particular case, reference is made to the Scientific Research Department of the Warner-First National Studios, at Burbank, where a forty-acre field under one roof is given over to the magic called Special Process, the supreme head of which is Mr. Fred Jackman, A.S.C., whose official title is Supervisor.

This quiet, unassuming man needs no introduction either to the industry or to the fans, for his twenty-five years of serv-

The Scientific Research Department of the Warner-First National Studios is housed in a process and miniature work The equipment is said to be the finest in Hollywood, a for appliances and lighting apparatus necessary to this work Almost all of this equipment experience through the years in actual production of motion pictures. Note the immens photographed after being designed and fabricated in several workshops which are arra shot at once on this stage and every possible effect in cinematography from undersea to secret that cannot be divulged In this picture Supervisor Jackman is standing in the foreground line as there is here shown This picture was

h Devoted Entirely To cess Work

lding 150x300 feet—the largest building in the industry devoted exclusively to special being tied up in cameras, optical printers and the thousand and one photographic been designed and developed by the various operatives themselves as a result of their af this stage—the main room of the building where the miniatures are set up and along one side and end of the immense structure. Two dozen miniatures could be astral from microscopic to gargantuan can be secured here—but how? That is the ter inspecting a set-up about to be shot. There is almost as much stage back of the it from a balcony on the extreme rear of the building

ice have covered every department of motion picture production—cinematographer, producer, editor, story-writer, laboratory expert, director, in addition to every phase of technical practice, including invention.

To enumerate his achievements and connections would be to write a sketch of the industry's history, but the fans will remember him forever through his work as director of "Rex, the King of Wild Horses," for Hal Roach and the technicians of the industry are still applauding his work in Warner's "Noah's Ark."

When the Warner-First National merger took place the two special process departments of the respective organizations were consolidated under the executive headship of Mr. Jackman, then for some time chief of Warner Brothers Studios.

The genius of a man is often reflected in the organization he builds around him and the executive staff of Mr. Jackman's department has no superior in the entire motion picture industry of the world. The list reads like a page of Who's Who in Pictures:

Alvin Knechtel, A.S.C., expert in charge of optical printing, lap dissolves, trick shots on sets, etc. Mr. Knechtel is also a licensed pilot and a skilled aerial photographer.

Hans Koenekamp, A.S.C., has a background of many years as a specialist in special process work. He was associated with Mr. Jackman in the production of "Noah's Ark" and has countless fine works to his credit. He has been co-operating with his present chief for fifteen years.

Vernon Walker, A.S.C., is head of the Department of Lighting and the Photographing of Miniatures. This is one of the most important posts in production and Mr. Walker has had a wealth of experience in the work. He, too, was with Mr. Jackman on "Noah's Ark."

J. Gibbons, construction engineer and chief of the Research Department is an authority in his line, which is one of the most interesting and important in picture production. Mr. Gibbons, also, was on the staff of Mr. Jackman during the filming of "Noah's Ark."

Henry Fisher is the laboratory expert of Supervisor Jackman's staff and in his line he has no superior. Mr. Fisher shared the honors of the great "Noah's Ark" success with Messrs. Koenekamp, Walker and Gibbons.

Willis O'Brien, famous for his work in "The Lost World," has charge of the department of Animation and Cartoons. He is the man who puts the life into inanimate figures and makes them act like the real thing. He is also an expert cartoon animator.

Ralph Hammeras is chief of the Art Department and expert in "glass shots." His paintings are realistic and he has had a wide and varied experience in his specialty. Mr. Hammeras had an important part in the production of "The Lost World."

John Cerasoli is the presiding genius of

Concluded on Page 35

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The Gall Patent

Continued from Page 19

across the optical axis of said lens, means to move a sensitized film across said axis and in a plane parallel to the plane of motion of said negative, said last-named means being adapted and arranged to move the film in a direction either the same as, or opposite to, that of said negative, at the will of the operator.

3. In a motion picture printing machine, a lens, means to move a motion picture negative intermittently across the optical axis of said lens, means to move a sensitized film in a plane parallel to that of said negative and in unison therewith, said sensitized film moving means being mounted so as to be moved around the axis of said lens.

4. In a motion picture printing machine, a lens, means to move a motion picture negative intermittently across the optical axis of said lens, means to move a sensitized film in a plane parallel to that of said negative and in unison therewith, said sensitized film moving means being mounted so as to be moved around the axis of said lens, a driving mechanism connecting said negative-moving means and said sensitized film moving means constructed and arranged to maintain such connection, irrespective of the relative position of said means.

5. In a motion picture printing machine, a lens, means to support and move a sensitized film across the axis of said lens, and means by which said supporting and moving means may be located so as to move said film across said axis in any predetermined direction.

6. In a motion picture printing machine, a lens, means to move a sensitized film across the axis of said lens, means by which said moving means may be located so as to move said film across said axis in any predetermined direction, a source of power, mechanism connecting said source with said moving means, said mechanism being constructed and arranged so that said source is always connected to said moving means irrespective of the position of the latter.

7. In a motion picture printing machine, a hollow trunnion and means for supporting and moving a film across the axis of said trunnion, said means being supported by said trunnion and movable around said axis.

8. In a motion picture printing machine, a hollow trunnion, a lens in said trunnion having its axis in the axis of said trunnion, and means for supporting and moving a film across the axis of said trunnion, said means being supported by said trunnion and movable around said axis.

9. In a motion picture printing machine, a pair of parallel hollow trunnions having a common axis, a lens in one of said trunnions, means for supporting and moving a film across the axis of said trunnion, said means being supported by said trunnions and movable around said axis.

10 In a motion picture printing machine, a hollow trunnion, means for supporting and moving a film across the axis of said trunnion, said means being supported by said trunnion and movable around said axis, a member mounted to turn freely on said trunnion, means to drive said member and mechanism connecting said member with said film moving means.

12. In a motion picture printing machine, a base, a pair of parallel supports carried by said base, a light-tight box mounted to turn on said supports and means in said box to support and move a film.

2. In a motion picture printing machine, a base, a pair of parallel supports carried by said base, a light-tight box mounted to turn on said supports and means in said box to support and move a film, a source of power outside said box and mechanism to connect said source of power with said film moving means.

13. In a motion picture printing machine, a base, a pair of parallel supports carried by said base, one of said supports being hollow, a lens in said hollow support having its axis in the axis of said support, a light-tight box mounted to turn on said supports and means in said box to support and move a film across the axis of said lens.

14. In a motion picture printing machine, a source of light, a lens, means for moving a negative motion picture film intermittently across the axis of said lens and between it and said source of light, means for supporting and moving a sensitized film intermittently in a plane parallel with the plane of said negative film and with said lens between it and said negative, a shutter located between said sensitized film and said lens and arranged to cut off the light from said sensitized film while the latter is moving, and supports for said sensitized film supporting and moving means, and said shutter, constructed and arranged so that said means and said shutter may be moved around the axis of said lens.

15. In a motion picture printing machine, a frame having an exposure opening therein, means to support and move a negative film intermittently past said opening, means to support and move a sensitized film past said opening in unison with said negative, a rotary shutter adapted and arranged to pass across said opening, and the exposure opening in said shutter while it is rotating, said mechanism being operable to so alter said exposure opening during any given speed of operation of the printing machine.

16. In a motion picture printing machine, a frame having an exposure opening, means for supporting and moving a negative film past said opening, means for supporting and moving a sensitized film past said opening in unison with said negative, a shutter adapted and arranged to move across said opening, and mechanism for automatically altering the exposure opening in said shutter during movement of the latter, said mechanism being operable to so alter said exposure opening during any given speed of operation of the printing machine, substantially as described.

17. In a motion picture machine, means for supporting and moving a film across the path of the light from a source of light, a shutter adapted and arranged to move between the film and the source of light and to cut off the light from said film, and mechanism for automatically altering the exposure opening in said shutter during the movement of the latter, said mechanism being operable to so alter said exposure opening during any given speed of operation of the motion picture machine, substantially as described.

18. In a motion picture machine, means for supporting and moving a film across the path of the light from a source of light, a rotary shutter disposed between said film and the source of light and adapted and arranged to cut off the light from said film, and mechanism for automatically altering the exposure opening in said shutter while it is rotating, said mechanism being operable to so alter said exposure opening during any given speed of operation of the motion picture machine, substantially as described.

19. In a motion picture machine, means for supporting and moving a film across the path of light from a source of light, a rotary shutter disposed between said film and the source of light and adapted and arranged to cut off the light from said film, and means for automatically varying, step by step, the exposure opening in said shutter while it is rotating, substantially as described.

20. In a motion picture machine, means for supporting and moving a film across the path of the light from a source of light, a rotary shutter disposed between said film and the source of light and adapted and arranged to cut off the light from said film, and means for automatically increasing, step by step, the exposure opening in said shutter while it is rotating, substantially as described.

21. In a motion picture machine, means for supporting and moving a film across the path of light from a source of light, a rotary shutter disposed between said film and the source of light and adapted and arranged to cut off the light from said film, and means for automatically increasing, step by step, the exposure opening in said shutter while it is rotating and for effecting the successive steps of increase in such exposure opening in successive rotations of the shutter respectively, substantially as described.

Concluded on Page 27

Jimmy the Assistant

Continued from Page 17

the drum at the usual rate, and the guy with the rack turns it slowly around on the ice pick spindle, letting the film lop off slow and easy.

Then, as the center is approached the rack has to be turned faster and faster until right at the end that rack is turning like a cage full of hysterical squirrels trying to catch up with next week.

The guy handling the drum doesn't dare look. All he can do is keep turning even and pray for the best. If he speeds up the least bit he pulls the film off a couple of laps at a time; and if he slows down the smallest trifle the film either doesn't come off or else hits the floor. And the bird with the rack—well, he had plenty to do. He had to keep that rack turning at just exactly the right ratio of increased speed from a half a turn a second up to invisibility.

I got very expert at handling the racks. My best record—and one that still stands, if I am not mistaken—was on one golden and glorious lucky day when I got three racks out of fifteen on the drums without scratching, dropping off the rack, or even touching the floor. I was given a half holiday and we had biscuits for dinner.

Poor old labs! They saw tough days, but somehow nobody minded. We were all young and ignorant and happy and that seemed to make everything right.

And we were ignorant. We had to be. Nobody with any sense would take such a job. Later, however, when conditions were improved, they were able to get some Russian immigrants to accept such employment; and from then on the 16 gauge copper wire mustache and the vodka breath became a regular feature of the newer labs.

Yet in spite of all our ignorance we managed to get by. We didn't know enough about chemistry to put salt in soup; but we managed to concoct a negative developer that would produce negatives that for all around density, blackness, and imperviousness to light beat anything ever seen before or since. We originated the case-hardened high-light and the empty shadow. We primitives alone have had the courage to use the same tank successively for developer, hypo, reducer, intensifier, and toning solutions. And we alone deserve credit for the startlingly original results we sometimes got that way. Where and how would double tinting and toning ever have been discovered except for us and our one tank?

Nothing worried us, nothing stumped us. We had a system of developing that couldn't miss. Simply let it cook until you can't see through it all all, and that's that. If, by any chance, it got so dense due to the cameraman's over-exposure that we simply couldn't print it without setting the film on fire, we'd cheerfully tackle the job of reducing. As a matter of fact, reducing was part of the daily routine. It was only when little mistakes were made, like trying to develop in the reducer, that we ever got into any trouble over it.

I'll never forget my first raise. I was just a dub kid, helping around, doing a little bit of everything. My principal job was to keep grit from getting into the wet emulsion. That was done by keeping the drying room floor very clean, for it was taken for granted that the film would be there at some time or another and keeping the floor clean seemed to be the only solution to the problem.

We hit a heavy day's work. A couple of thousand feet of film came swamping in on us and it kept us so busy that it was quitting time before we got around to putting the stuff on the rack. So we quit. It seemed to be the usual thing to do, to quit at quitting time, so we quit, leaving the day's work gurgling to itself in the washing tank.

I learned about the rest of it next morning.

It seems that my boss went over to the Dutchman's for his dinner, and, that being many years before prohibition, hoisted a few. His hoister working extra good that evening, he proceeded to hoist merrily until his conscience commenced jabbing him. That film, all alone in the wet, bothered him. It wasn't right!

And so he went back to the lab and put every foot of

Continued on Page 30

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The A. B. C. of Sound Pictures

By Joseph Dubray, *A.S.C.*

Second Paper

Physicists have devoted time, energy and patient research in the effort to better understand the actions, moods and peculiarities of sound waves. Since sound is very apparently produced by vibrations it was quite natural that the physicists should attempt to render these vibrations visible and after succeeding in doing so they would strive to obtain a permanent graphic record of them.

In 1880 Thomas Young devised a simple apparatus consisting of a cylinder rotating on its axis and covered with lamp-black and a vibrating sound-producing metallic rod, one end of which was securely fastened while the other tapered to a point, was so set as to barely touch the lamp-black coating on the cylinder.

When the rod was made to vibrate, and thus produce a sound, and the cylinder was rotated, the point of the rod would scratch the lamp-black off the cylinder following a sinuous line, the form of which would vary according to the characteristic of the vibrations and hence of the sound.

A wavy circle was thus traced on the cylinder which permitted the study of the vibrations of the rod and enabled one to compare them with vibrations producing a different sound.

Lissajou, about the year 1850, devised an ingenious method by which he could examine the sound vibrations.

He fastened a tiny mirror on one of the two prongs of a tuning fork. He set an artificial source of light at a certain distance from the mirror so that a small pencil of light rays passing through a small orifice would strike the mirror, attached to the tuning fork. The pencil of light would be reflected upon another small mirror and again reflected by this second mirror upon a screen. An achromatic lens was placed in the path of the reflected rays so as to form a sharp image of the little hole through which the beam of light was forced to pass.

The tuning fork being at rest, a luminous point was seen on the screen but as soon as the fork was made to vibrate, an elongated image of the hole could be seen, due to the fact that the image of the point source of light was displaced very rapidly and according to the vibration of the fork. Through the phenomenon of persistence of vision all these rapidly succeeding images of the point of light could not be seen separately but would give the impression of a bright line on the screen, just as the tip of a red hot piece of charcoal when rapidly moved up and down in the dark, will be seen as a glowing red line.

By rotating the tuning fork, and consequently the mirror attached to it, a sinuous bright line was to be seen which was a graphical representation of the vibrations of the tuning fork and, consequently, of the sound corresponding to those vibrations.

Lissajou was able, by these means, to conduct a very methodical investigation on sound vibrations and extended it to the investigation of combinations of sounds by submitting the source of light to two reflections by means of mirrors fastened to two tuning forks of equal or different pitch.

Another very interesting method of conducting this investigation was devised by Konig who transmitted the sound vibrations to a gas flame.

Konig, in 1873, devised a capsule divided into two compartments separated by an elastic membrane. One of the compartments he filled with gas which would be ignited at a jet communicating with the chamber. The gas was kept at a constant pressure in the chamber by a continual admission of gas.

At the other chamber Konig adapted a tube ending in a mouth piece through which the sound vibrations of an instrument or voice could be transmitted to the elastic membrane.

If the air within this second chamber was at rest, the gas flame would burn very steadily, but as soon as the elastic membrane would begin to vibrate the pressure within the gas chamber would vary according to the extent of the vibration and the gas thus unequally forced out of the jet would cause variations in the shape and height of the flame, which could correspond to the variation in the vibrations of the membrane, hence of the sound vibration which caused them.

In front of the gas jet and at a certain distance from it Konig placed a cube faced with mirrors, which could be made to rotate on its axis.

The phenomenon of persistance of vision again showed, when the cube was set to rotate, the vibrations of the gas flame in the form of a dented band of light which was of very regular shape whenever the sound vibrations were proceeding from a pure note and of an irregular shape resembling tongues of fire of different heights when two notes or other impure sounds were investigated. Although the Lissajou's and Konig's methods were extremely interesting and permitted accurate study of sound vibrations they did not present the possibility of keeping a graphical indestructible record of the vibrations.

The French physicist Duhamel improved upon Young's experiment by preparing a cylinder traversed by an axle, with one handle at one end and screw-threaded at the other end. This cylinder he set vertically, held by two prongs pierced with holes, the lower one of which was threaded and then working as a fixed nut into which the threaded portion of the axle was engaged.

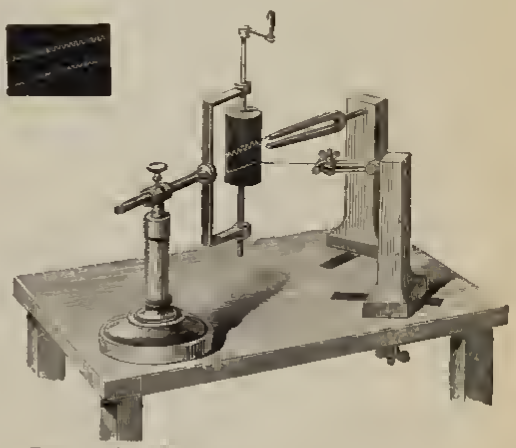

Fig 1* Duhamel's method of recording Sound Vibrations

By turning the handle a **circular** and a **verticle** movement were thus simultaneously imparted to the cylinder.

Upon the cylinder Duhamel fastened a sheet of heavy paper covered with a thin film of lamp-black mixed with glue. A pointed steel rod was then fastened steady at one end and so set that its other tapered end would barely touch the paper.

The rod was then made to vibrate so as to produce an audible sound and when the cylinder was set in motion, at a determined rate of speed, the metal rod would scrape the lamp-black coating whenever it touched it and as in

Young's experiment, trace an undulating line which represented graphically the vibrations of the rod.

Duhamel also set at a different height than the rod, a tuning fork, giving a known pure tone, and, at the end of one of its prongs, he attached a stylus barely touching the lamp-black coating.

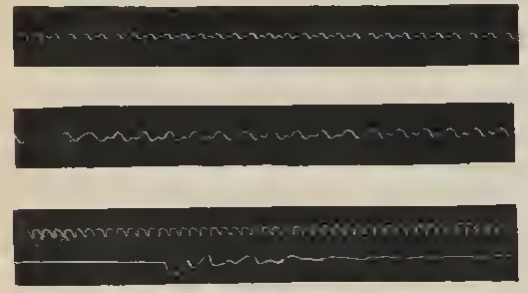

Fig. 2A* (a) Graph representing the vibrations of a sung simple note strengthened by means of an upper octave
(b) Graph representing the vibrations of two organ pipes whose notes differ by one octave
(c) The upper line represents the vibrations of a tuning fork at 500 vibrations per second and the lower line represents the vibrations produced by the sounding of a rolling R

By setting both the tuning fork and the metal rod to vibrate and the cylinder to rotate he would be able to record the vibrations of both at the same time and a single calculation would permit him, by comparison, to determine the exact number of vibrations imparted to the steel rod.

This method, though very ingenious, did not permit to make a record of the human voice or of any musical instrument.

Leon Scott, in 1857, constructed an instrument which he called the **PHONAUTOGRAPH,** which consisted in a barrel of eliptical form acting as a mouth piece, or better as the external part of the ear, which collects the sound vibrations.

The smaller end of the barrel was closed by an elastic membrane, which could be stretched to any desired tension. A feather stylus was fastened to the membrane and an ingenious device was proposed by Scott in order to insure its proper functioning. A drum similar to the one used by Duhamel was set horizontally so that the point of the feather would barely touch the lamp-black coating.

A circular and forward movement could be imparted to the cylinder at the same time, and the sound vibrations entering the barrel would set the membrane and stylus to vibrate and cause it to scratch a record upon the cylinder.

These ingenious instruments, and others which would require too much of our limited space to describe, permitted the study of sound vibrations and consequently of sound waves which lead the way to rapid and astounding progress.

Among the most interesting investigations we may mention those of McLeod and G. S. Clarke, who devised, in 1880, a Stroboscopic method, and those of Paul La Cour and Lord Raleigh.

Finally, in 1877, the American wizard, Thomas Alva Edison, gave to the world an astounding and truly revolutionary invention. We refer to the **"phonograph,"** the name of which was taken from the Greek words, "Phone" and "Grapho," the meaning of which is "to write sound."

Not only did Edison succeed in obtaining a graphical record of the sound vibrations, but he made it possible to **reproduce** them and thus **recreate** the sounds which he had, so to speak, "stored away."

The first Phonograph was essentially based upon Young's and Duhamel's principles. It consisted of a cylinder which could be made to rotate and move sideways at the same time, and of a vibrating membrane at one end of a mouth piece to which a small steel point was attached.

The merits of Edison's invention were derived from two factors He replaced the lamp-black coated paper by a sheet of tinfoil, and the vibrating membrane by a thin metallic disc. The steel point attached to the vibrating disc would gently press upon the surface of the tinfoil and engrave on it the vibrations which a sound would impart to the disc.

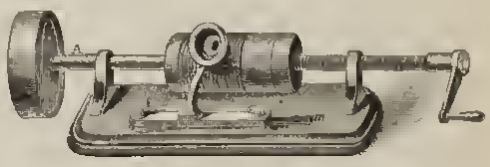

Fig 3* Edison's Phonograph (1877)

The disc which was later called the "diaphragm," was a very ingenious apparatus by itself, controlled by a light spring and small pieces of rubber tubing.

The position and pressure of the diaphragm could be regulated at will. After the desired sound was impressed upon the tinfoil the diaphragm and cylinder could be reset at their initial position and by setting the cylinder in motion the stylus would follow the indentations of the tinfoil and go through the same series of movements into which it was previously forced by the vibrating disc.

This movement was thus transferred to the disc which in turn would set the air within the mouthpiece to vibrate and would thus originate sound waves very similar if not exactly equal to those which had originated the indentations in the tinfoil and a **reproduction** of the original sound was thus obtained.

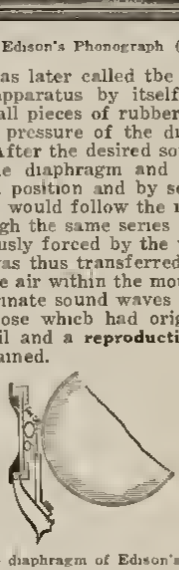

Fig. 4* Section of the diaphragm of Edison's phonograph (1877)

The microscopic examination of the impressions engraved on the tinfoil disclosed that their section has the same appearance as the Konig's flames seen in the rotating mirror.

It is quite interesting to review a description of Edison's phonograph and the comments made by Ganot, one of the celebrated physicists of the epoch, who stated that: "In this way sound has been reproduced so as to be audi-"ble to a large audience; the articulation is distinct "though feeble; it reproduces the quality of the person's "voice who speaks into it, but with a nasal intonation. "There is a great difference in the distinctness with which "the various consonants and vowels are reproduced; the "S, for instance, is very difficult."

Edison's phonograph has nevertheless grown from a babbling childhood to stupendous manhood, and its benefits to humanity are as innumerable as they are delightful.

(To Be Continued in May)

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Foreign News

ENGLAND

From reports received by the Department of Commerce from representatives abroad.

The British trade press reports that during January, 1929, 61 feature films were trade-shown in Great Britain. Divided by countries of origin they were as follows:

America	36
England	12
Germany	12
France	1
	61

Three entirely new studios have been built, one in Elstree, one at Welwyn and one at Wembley. Existing studios have been enlarged and studios which were only in occasional use are now fully occupied

FRANCE

The "Societe Pathe Consortium" is to abandon the word "Pathe" and the Pathe trade mark The new name of the organization will be "Paris-Consortium-Cinema."

It is rumored that Pathe is going to start production and distribute its films through its own releasing organization.

The French Syndicate of Cinema Managers announces a new invention—"The light refrigerator," demonstrated in Paris, February 5th and 6th. This apparatus, it is said, turns the burning light rays of the projector's lamp into cold rays, thus eliminating fire danger and prolonging the life of the film

GERMANY

At the Neubabelsberg studios two new U F.A feature pictures have been recently completed, "The Wonderful Deception of Nina Petrovna," and "Fleeing from Love."

SWITZERLAND

A new company, capital 500,000 Swiss francs, has been formed in Glaris under the name of "Cicolfina," its purpose being the manufacturing of nature-color films.

The Gall Patent

Continued from Page 23

22. In a motion picture machine, means for moving a film across the path of the light from a source of light, a shutter adapted and arranged to move between said film and the source of light and to cut off the light from said film, and means for automatically varying, step by step, the exposure opening in said shutter during the movement of the latter, substantially as described

23. In a motion picture machine, means for moving a film across the path of the light from a source of light, a shutter adapted and arranged to move between said film and the source of light and to cut off the light from said film, and means for automatically varying, step by step, the exposure opening in said shutter during the movement of the latter and for effecting successive steps of variation in such exposure opening in successive movements of the shutter respectively, substantially as described.

This specification signed and witnessed this 14th day of May, 1912.

ADOLPH F. GALL.

Witnesses:
Henry Lanahan,
Anna R. Klehm.

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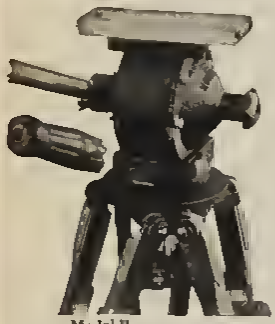

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The New Dupont VA Film

VA—"Variable Area Sound Recording Film"

A survey of the field which was made prior to the working out of a special film for variable area recording revealed the fact that positive films do not have sufficient sensitivity for the purpose. Recording engineers are forced to operate their exposing lamps considerably above the rated amperage—a practice which shortens the life of the lamp and increases the danger of lamps burning out during the taking of important scenes. In addition to this evil, laboratories find it necessary to force development of the sound track in powerful developing solutions. This practice slows down laboratory production and produces undesirable effects in the film.

The new DuPont V. A. film with its higher sensitivity not only allows the reduction of recording lamp currents to safer levels but also shortens very considerably the time of development necessary to produce the desired track density.

Some idea of the improvement in working conditions with DuPont V. A. may be obtained from the results of a comparetive test made by the technicians of a concern using the variable area recording system. It was found that positive stock exposed at 4.2 amperes required a development of 6½ minutes as compared to a developing time of 4½ minutes for DuPont V. A. exposed at 3.8 amperes. The comparison test also included the recording of very high frequencies and it was found that the DuPont V. A. was fully equal, if not superior, to positive stock in its ability to record high frequencies.

In short, the use of DuPont V. A. makes it possible for sound recording engineers to reduce their lamp currents and increase their factor of safety; it makes possible a very considerable increase in production for the laboratories, and does away with the bad film effects attendant on forced development.

In including all these advantages in the DuPont V. A. it has not been necessary to sacrifice, in the slightest degree, the ability of the film to record frequencies far higher than those needed for practical purposes.

VD—"Variable Density Sound Recording Film"

The most important features of the V. D. film are its high resolving power and low gramma infinity. A special treatment is given the film in the course of its manufacture which considerably increases its resolving power and makes it capable of recording frequencies far higher than those needed in practical work. The same treatment also serves to limit the maximum gamma obtainable with the film to a value of approximately 0.8 as compared with a value of 2.8 which is representative of positive emulsions. This unique feature insures far greater ease and exactness in the control of development since the increase of contrast with time of development is much slower than with positive film.

It has long been recognized that it is very advantageous to develop a film to at least 75 per cent of its gamma infinity. This criterion is met satisfactorily by the V. D. film with its gamma infinity of 0.8 since it is common practice to develop variable density sound track to a gamma of 0.5 to 0.6.

Another distinct advantage which is characteristic of this film, is its freedom from the halo effect at the junction of a high and a low density. The bromide liberated restrains development in the adjacent portion of the low density. This effect is characteristic of emulsions of high gamma infinity and becomes objectionable in the recording of high frequencies of large amplitude.

V. D. film does not require any greater exposure than positive stocks and will improve the reproduction of sound, not only because of its high resolving power and freedom from halo effect, but also because of its foolproof development characteristics.

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New Filmo Enlarger

The February issue of "Filmo Topics," the Bell & Howell publication for amateur movie makers, announced a new enlarging device which gives promise of answering the oft-repeated question—"How can I get good enlargements from my 16 mm. films."

The device, which is used in conjunction with any Filmo Projector, produces very creditable enlarged negatives, 2¼x3¼ inches in size, with a minimum of effort on the part of the operator. It may be used under any light, natural or artificial No darkroom is necessary.

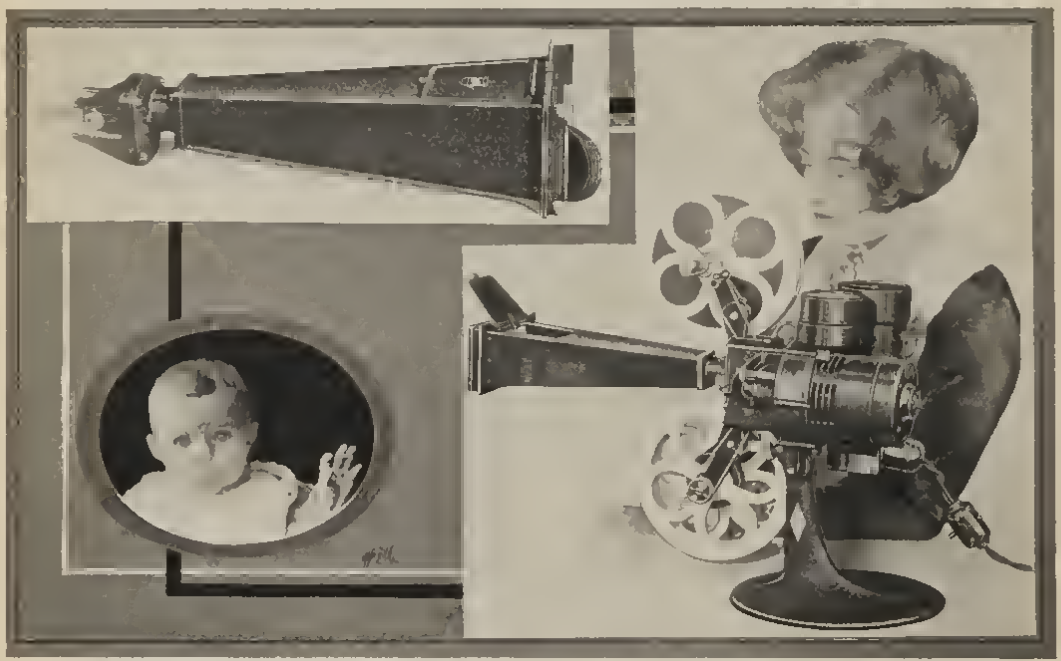
The Filmo Enlarger consists of a tapered box, at the small end of which a special enlarging lens is mounted in fixed focus. The regular projection lens is removed and the enlarger is slipped onto the projector in such a way that the enlarging lens replaces the regular lens. A bayonet-like shaft on the enlarger comes into firm contact with the projector aperture plate and automatically focuses the enlarging lens. A set screw locks the entire unit firmly into place.

A film pack adapter, supplied with the Enlarger, is loaded with the handy film pack and slipped into place at the large end of the tapered box The hinged cover at the top of the box is then raised so that the film may be viewed as it is projected upon the white surface of the film pack adapter slide.

When a scene from which an enlargement is desired appears upon the screen, the projector clutch is disengaged, the enlarger shutter closed, the pack adapter slide removed and the picture is projected just as one would project a single frame upon a screen. Then the enlarger shutter is pressed, giving an instantaneous exposure and producing a properly timed negative from any correctly exposed frame of reversal or positive film

The film packs used are of the 6x9 centimeter (2¼x3¼ inch) size, so that contact prints made from negatives produced with the enlarger are of a popular size for album purposes. The enlarged negative can be developed and contact prints produced by any photo finisher at a very moderate cost Enlargements to even greater size may also be made from these negatives, just as any still camera negative would be enlarged.

Simple, easily used equipment such as the Filmo Enlarger opens up new possibilities for those who "reel their own movies." If you want both stills and movies of your travels, but prefer to travel light, it will now only be necessary to carry one compact little camera. If your films contain favorite close-ups showing true-to-life expressions and mannerisms you have had trouble in catching on "still" negatives, you can now produce these elusive pictures for your photo album. If your still pictures are posed and stilted, you can get natural results by making enlargements from your movie films of the same subjects.



Left A picture produced from 16 mm film with the new Filmo Enlarger Right Viewing a film to select frames to be enlarged with the new Filmo Enlarger The projection surface is the white-painted film pack adapter slide Top: The Filmo Enlarger, complete with its film pack adapter loaded and in place for use. At the left are the special enlarging lens and the focusing range.

Jimmy the Assistant

Continued from Page 24

that stuff on the drums alone—and from pin-ricks, too How he did it nobody will ever know But he did! He got it all on, started the motor to turn the drums and went home to a well deserved night's rest But he had made a slight oversight Being unable to readily locate any of the rubber bands that were scattered all over the drying room he simply fastened the film onto the drum by stabbing a push pin through the film into the slat

Now the film in drying first relaxes then tightens up This film, whirling merrily around, stretched just enough to allow the emulsion to touch the floor The next morning we found a deposit of drama an inch thick where it had touched Then, having done all possible in that direction, it tightened up pulled, and very easily slit itself out from under the restraint of the pins

The night watchman was awakened by a sound as of a troupe of Australian whip crackers holding a cracking contest in the drying room He went in and beheld havoc

It took a brave man to dash into that inferno of lashing celluloid to get at the switch but he did it and that was that

The day's work was utterly ruined

The boss was very much surprised when he got to the studio and found out that he was fired It made him so sore that he quit, which put the company in a terrible fix, for he was the only one who knew the formulas

But I knew about how they were made and so I was raised to six dollars a week and given charge of the lab on the strength of it

They don't run laboratories like that any more

Incandescent Lighting Improves

By R. E. FARNHAM

Engineering Department, National Lamp Works of G. E. Co.

"What a remarkable use of light," was the general comment of those who saw the big "Broadway" set at Universal. This set was spectacular in more than mere size; it was an excellent example of the versatility of light. Forty-eight hundred lamps, ranging in size from 40 to 5000 watts, and totaling 3,900,000 watts, were employed to obtain the many unique and colorful effects. Much credit is due Hal Mohr, A. S. C., Frank Graves, and Paul Fejos, the director of the picture, for their handling of the lighting and their ingenuity and skill in incorporating into the cabaret scene much of the 'Art Moderne.'

R. E. Farnham

The set is also noteworthy in that it marks a distinct milestone in the progress of studio lighting with incandescent lamps. It gives a visual demonstration of many of the possibilities of photographic and effect lighting with incandescent lamps, and marks the first anniversary of the extensive use of this source in studio photography.

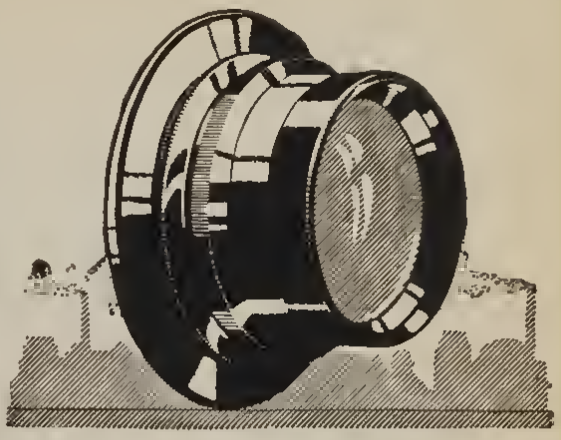
About a year ago, at the time when panchromatic film became universally used in the studios, cameramen and producers were anxious to derive the full advantage of this film, and accordingly the American Society of Cinematographers and the Academy of Motion Picture Arts and Sciences arranged a series of tests of studio illuminants with particular reference to the use of incandescent lamps. These tests served the threefold purpose of acquainting the producers, directors and cinematographers with the full photographic possibilities of this source, of giving the cinematographers and electrical staffs a limited amount of experience in making pictures with incandescent lighting, and of indicating to the lamp and equipment manufacturers the requirements of their respective products in studio lighting service. Extensive use of incandescent lamps followed these tests immediately and their application has been increasing continuously since.

Both the lamp and lighting equipment manufacturers, beginning with engineering tests conducted in many of the studios and from the experience gained from the demonstrations, have made many changes which have improved the lighting results and the efficiency of incandescent lighting equipment.

The standard method in American studio lighting has been to use portable lighting equipment almost entirely, a practice which is largely responsible for the great variety of lighting effects observed in our films and which keeps the equipment more continuously in service As a result, incandescent lamps used for this service must be made to withstand severe handling. Hence the first general improvement in the lamps used for studio lighting service has been to make them more rugged. Experience of recent months shows very gratifying results; the number of lamp failures due to handling has been greatly reduced. The studio electrical staffs have likewise gained experience in the handling of the lamps, which has materially helped.

The 5000 and 10000-watt lamps now contain a coarse tungsten powder which is easily shaken around the inside of the bulb from time to time during the life of the lamp. This effectively removes all of the bulb blackening and results in improved maintenance of the light output of the lamps. Longer life is also gained since in many cases lamp life is determined by the blackening of the bulb. This development makes possible further increase in the efficiency, or light output for a given wattage, of the lamp with resulting greater photographic effectiveness.

A monoplane filament construction, capable of satisfactory operation in other than the vertical position, has been developed and incorporated in the 2000, 5000 and 10000-watt lamps generally used for modelling lighting. This form of filament construction gives a uniform, well



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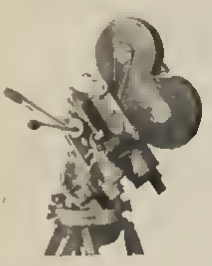

The three views above show Bell and Howell, Mitchell, and De Brie Cameras mounted on the Akeley Gyro Tripod. A very clear idea may be gained from these shots of the maximum upward and downward tilt given to the camera by this Tripod.

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defined field of illumination free from color streaks, not always possible with the older bunched, or barrel-shaped, construction.

Frequently it is necessary to employ higher general illumination intensities without increasing the number of units. For this purpose a 2500-watt PS-52 bulb lamp has been made available. This lamp has the same physical dimensions as the more familiar 1000 and 1500-watt types and may be used interchangeably in the same equipments, provided they are sufficiently ventilated for the higher wattage.

Since incandescent lamps are available in many sizes and are very compact, many new lighting effects are possible. They have been used in table lamps, wall brackets, large and miniature signs. Interesting effects are obtained by operating them under water. Pictures have been made using the light from automobile headlamps, in which lamps of somewhat higher wattage than the regular automobile headlight lamps were used Even the stars in the heavens have been imitated using bare lamps, as in the cabaret set in "Broadway."

There have been many important improvements in the incandescent lamp equipment. For the general illumination of motion picture sets, units which incorporate a high efficiency reflector have been made available. These "broadsides" directed more than 40 per cent of the light output of the lamp into areas where it is useful, as compared with 15 per cent with the older types. New reflectors are at present being developed which gives an even more uniform distribution and are capable of taking the 2500-watt lamp. Although these high efficiency equipments are radically different from anything they have used before, cameramen have been quick to see their advantages and they are now quite extensively used as floor units and "scoops," and when several are formed into a cluster they make excellent "domes."

The light output of the very popular 18-inch reflector spot has been increased one-third by shortening the housing so that nearly the entire area of the mirror is used when the lamp is operated at the wider beam spreads When the spill light from these units is objectionable, it can be readily eliminated by the use of a spherical mirror developed for this purpose, placed on the front side of the lamp. The use of this mirror increases the volume of light in the beam by about 30 per cent, in addition to doing away with the spill light.

Dimming resistors have been frequently employed in the lamp circuits so that the effect of sunrise or fading daylight can be duplicated Even the breaking up of the glass bulbs of burned out lamps has been employed for sound effects.

Both the lamp and equipment manufacturers maintain a close contact with the studios and are constantly cooperating with the camera and electrical staffs in working out new uses for lamps, and suggesting the best lamp and equipment for each new application. Back in the laboratories of the lamp manufacturers, engineers familiar with the lighting needs of the cinematographers are constantly endeavoring to develop lamps which will meet, even better than they do now, the wide variety of studio lighting requirements

Amateur Studio Picture

Continued from Page 16

easily controlled and effective. We have used them a little but not half so effectively as the makers of the film "Ninety Seven Dollars," recently released by F B.O. This film was made in Hollywood by a painter in collaboration with a professional director, and the cost is indicated by the title. The lighting equipment consisted of one 400-watt lamp. Some magnificent shadow effects were obtained by moving the lamp behind cardboard silhouettes. The film was also very ably cut. It is all in the way you do it.

Another spare time film is being made after working hours in one of the big studios by the art director of the studio and the director of "Ninety Seven Dollars" They are especially proud of the small amount of electricity used on their sets. Apparently the production of super features no longer appeals to professionals with a real interest in the motion picture as being fun, and they are descending to amateur methods to get a little satisfaction out of their work.

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The Dawley Patent

Continued from Page 5

of your investigation of the practice, and realizing that public use to be effective as a bar must have taken place in this country two years prior to the Dawley filing date, which would be prior to August 17, 1912, we feel that the chance of a successful attack on the Dawley patent on that ground is so slight as to be negligible.

The Dawley patent appears to us to be a pioneer or a basic patent in the sense that the inventor was the first to recognize the problem and to accomplish his solution of the problem by the invention of the art or method of the patent, and that therefore the patentee is entitled to a wide range of equivalents and a liberal interpretation of the terms of his patent. This is especially true in view of the comprehensive scope of the specification and the claims of the patent. Such terms as "photographic images" should be given a very broad interpretation so as to retain to the inventor the full benefit of his invention.

The claims are all art or method claims, and it is elemental and fundamental in patent law, that, if some one uses the steps defined in any one of the claims of the patent plus additional steps, infringement would be found, because the inventor's broad or basic idea is appropriated. This is also true where any one of the steps of the patent is omitted and some equivalent act substituted in place thereof.

To illustrate our views as to the scope of this patent, we refer briefly to certain practice or methods which, in our opinion, infringe the claims thereof.

Of course, where a photograph of a set or scene is used and an image thereof effected on the negative either simultaneously with or successively to the effecting of the photographic images of the actors thereon, there can be no question of infringement.

We see no difference, as far as infringement is concerned, when the scene is in the form of a painting and is used in the manner described in the Dawley patent. A painting and photograph of a scene or set, in our opinion, are full equivalents, one for the other, and, in our opinion, the question of infringement is not affected whether the exposures are made simultaneously or successively. This is for the reason that the fundamental idea of the Dawley patent is the saving of expense in using a photograph instead of constructing the actual set or scene or instead of transporting the actors to the locality of the natural scene. A substitute for this in the form of a photograph of the set or scene, or a painting of the set or scene, is the essence of Dawley's invention, combined with the co-relation on a negative of the photographic images of the set or scene and the actors in such a way that they properly merge so as to produce a natural effect. The use of a painting or photograph on glass with a portion clear or transparent (or on a cardboard similarly cut out) and photographing the action through the clear glass (or through the cut-out cardboard) is an adaptation of the Dawley invention and an infringement, whether done simultaneously or by double exposure or successively Similarly, the taking of the pictures of the actors in front of a black background alone, and then exposing the film to the photographic background, whereby a composite negative is obtained is also an infringement, or photographing the photograph or painting on a negative and photographing the actors on a separate negative and developing them and obtaining a combination positive from the two negatives, either by printing with the negatives superimposed one upon the other, or by printing separately upon the positive, comes clearly within the Dawley patent.

It seems to us that there must be a number of combinations of these steps of the Dawley inventions which might be used in practice, according to the desire and technique of the operators themselves, and it would involve considerable speculation on our part to attempt to describe all such possible processes which might come within and infringe the Dawley patent

The Dawley patent is based upon a fundamental and practical idea and the claims are entitled to a wide range of equivalents and would be construed with liberality so as to give the picture the benefit of his real invention which is so comprehensively described in the patent

PRINDLE WRIGHT NEAL AND BEAN

Date, New York, N Y November 20 1928

Viewing Filter

By Dr. White, *Physicist*
Redpath Laboratory

Practice shows that in a large number of cases the best picture is the picture which most closely approximates the brilliance contrasts in the subject as independent of the other contrast factors, hue and saturation contrast. The increase in color sensitivity introduced by panchromatic film made possible a much closer approach to correct representation of brilliance contrast in scenes than bad previously been possible. It has not yet been commercially practicable to produce a film which records the brilliance factor exactly as recognized by the eye. Hence, there is still a chance of error in judging whether the picture will be satisfactory by looking at the scene with the unaided eye.

With orthochromatic film, cameramen frequently used some form of blue glass viewing filter to aid the eye in judging brilliance contrast as the film would record it. The scene thus viewed, almost reduced to a monotone, gave a close approximation to the picture finally obtained since the sensitivity of the orthochromatic film is predominantly in the blue and blue green. Reds and greens as photographed appeared dark and also appeared dark viewed through the blue glass viewing filter. However, good as this was, in extreme cases it was not accurate since the sensitivity of such film extends into the ultra violet where the eye is insensitive.

With panchromatic film the blue glass is no longer applicable, but should be replaced by a viewing filter which aids the cameraman and costumer to see the scene with the brilliance contrast which the camera will record. Since the advantage of panchromatic film from a point of view of color rendition is its wide range color sensitivity, it follows that such a viewing filter can not render the scene as a monotone and be even approximately correct. It must show blue to red since the film is sensitive from blue to red. Most people are not used to judging brilliance as independent of color. In some cases, the judgment is difficult, but it surely is easier the more closely the scene, as viewed, approximates the relative brilliance values that will be recorded by the film.

A good viewing filter will help in the pictures where a correction filter over the lens is desired. If the viewing filter is accurate, viewing the scene through it and at the same time through the correction filter contemplated will give an idea of the correction introduced and can aid in the selection of a filter to secure the desired result.

The DuPont viewing filter, designed primarily for DuPont panchromatic film seems to be a very satisfactory approximation of the ideal filter for that film.

Biggest Stage on Earth

Continued from Page 21

the Department of Modelling, Designing and Wood Carving. It is he who designs and builds the figures of men and animals used for animation. He is a real artist.

Chief Engineer Walter Ebhard, known far and wide as "Snowy," has charge of Electrical Effects and constructs all apparatus of an electrical nature used in production in Mr. Jackman's department.

Miss Doris Farrington, who has been with First National for many years as a writer, cutter and researcher, is secretary to the supervisor, and catalogues all films. She is an expert as an estimator of costs and has charge of the office of this great Aladdin's Palace.

Mr. Jackman and his staff are now working out some intensely interesting problems for productions to feature Corinne Griffith, Colleen Moore and other First National-Warner stars and among other big technically important pictures coming up is "The Port of Missing Ships" which will afford opportunity for another demonstration of this marvellous art called special process.

Patents vs. Patents vs. Practice

Continued from Page 18

September 10, 1918. In view of the Sontag and Dischner patents and my own interpretation of the Dawley description, illustrations and claims, I see in the Dawley patent only a method comprising reflection of background scene. But frankly, I know of no way by the reflection method to move actors across or in front of a picture of Egypt, as he mentions, without having a Pyramid sticking through an actor's face or elsewhere. Of course I have never seen a demonstration or motion picture using Dawley's described method and unfortunately I have failed to find anyone else who has.

4. Or finally, composite photographs can be produced, according to the effect desired, by several modern methods now in vogue among the able technicians working in practically ever motion picture studio. Many of the principles involved are trade practices open to all, but when it is advisable to use practical process covered by valid patents, those processes are well known and available.

In closing, it is not my intention to refute legal opinions on this subject. Such interpretations contain meat. But an attorney is rarely a practitioner of the subject he is asked to interpret. He must depend upon facts given him by his client. If these are withheld, even in part, then the conclusions drawn will naturally be based upon a false hypothesis

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